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The IRON AGE

Illinois U Library

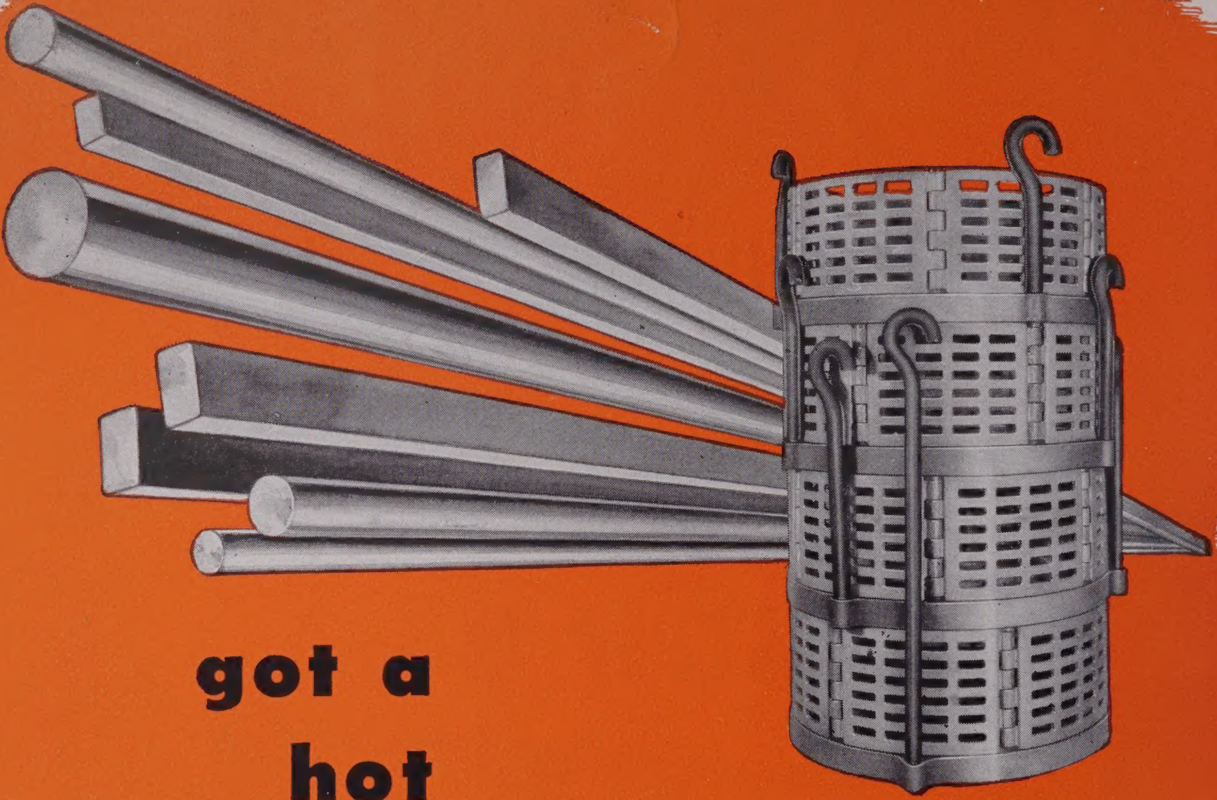
JUNE 24, 1948

Continuous
HOT STRIP MILLS

Mesta 80" Four High Continuous Hot Strip Mill

Designed and Built by
MESTA

DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS
MESTA MACHINE COMPANY · PITTSBURGH, PA.



got a hot job?

. . then there's a place in your plant for Hoskins Heat Resistant Alloy . . .

Looking for an alloy that stands up to heat? An alloy . . . cast or hot rolled . . . that's highly resistant to oxidation? . . . the destructive action of most furnace gases? Need a strong, durable alloy . . . light in weight yet possessing excellent load carrying ability? An alloy that retains much of its original ductility even after long, hot periods of hard, continuous use? Then best you get acquainted with Hoskins Alloy 502 . . . it "fills the bill" wherever a metal is required to resist heat and give long dependable service.

Design and Development Service

Next time you're up against a tough alloy problem, get in touch with Hoskins. If it's the design of a special heat resistant casting, chances are you'll find it already on file among more than 4,000 other tried and proven Hoskins designs. If it's the development of a new special purpose alloy, chances are Hoskins metallurgical laboratories can turn up with the right combination to meet your particular requirements.

HOSKINS MANUFACTURING COMPANY
4445 LAWTON AVE. • DETROIT 8, MICHIGAN

Chromel
nickel-chromium wire

Heating Element Alloys ★ Heat Resistant Alloys ★ Thermocouple Alloys ★ Spark Plug Electrode Wire ★ Special Alloys of Nickel ★ Electric Heat Treating and Laboratory Furnaces

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THE IRON AGE, published every Thursday by the CHILTON CO. (INC), Chestnut and 56th Sts., Philadelphia 39, P
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Countries $20 per year. Single Copies 35¢. Annual Review Number, $2.00. Vol. 161, No. 26.

..then you
dd a pinch
f *thyme*

There's an element of art in every business. The skills of the steel craft, shared and advanced through neighborly cooperation, have brought Barium customers the best possible steel and steel products.

Consider the advantages of Barium's coordinated facilities for melting, rolling, casting, forging, stamping, machining and fabricating the steel used in your products. All of us in the Barium corporate neighborhood are ready to do our part in the often complex job of procuring and processing the steel you specify.

Get acquainted with the Barium subsidiary which can best advise you on your problems and supply your needs.

WE MELT, ROLL, CAST, FORGE, STAMP, MACHINE AND FABRICATE STEEL

ONE OF THE 16 BARIUM GOOD NEIGHBORS

HE GEOMETRIC STAMPING COMPANY
LEVELAND, OHIO
bsidiary of Barium Steel Corporation

Leading producer of medium and heavy metal stampings and assemblies. Geometric craftsmanship has served stamping users for over 30 years. Large modern plant has presses of 40 to 450 ton capacity . . . complete facilities in metal fabrication and welding . . . tool and die design and construction . . . engineering and redesigning.

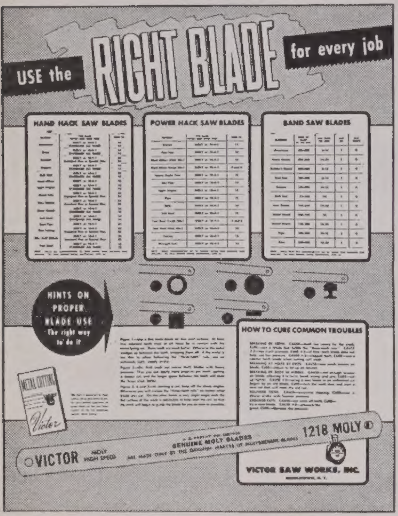
Barium
STEEL CORPORATION
STEELWRIGHT TO THE NATION

BARIUM STEEL CORPORATION

EXECUTIVE OFFICES
25 BROAD ST., NEW YORK, N. Y.

AMERICAN STEEL TRACTOR CORP., *Canton, Ohio* • CLYDE IRON WORKS, INC., *Duluth, Minn.* • CENTRAL IRON AND STEEL COMPANY., *Harrisburg, Pa.* BARIUM STEEL & FORGE, INC., *Canton, Ohio* • BARIUM EQUIPMENT CORP., BARIUM STEEL EXPORT, INC. • BAYONNE BOLT CORP., *Bayonne, N. J.* THE CUYAHOGA SPRING COMPANY, *Cleveland, Ohio* • THE GEOMETRIC STAMPING COMPANY, *Cleveland, Ohio* • PERMA-JACK CORP., *Cleveland, Ohio* PORCELAIN STEELS CORP., *Cleveland, Ohio* • THE DETROIT STEEL CASTING COMPANY, *Detroit, Mich.* • SHEFFIELD IRON & STEEL CO., *Sheffield, Ala.* KERMATH MANUFACTURING COMPANY, *Detroit, Mich.* • KERMATH (CANADA) LTD., *Toronto, Ontario, Canada* • REPUBLIC INDUSTRIES, INC., N. Y. GLOBE FORGE, INC., *Syracuse, N.Y.* • ERIE BOLT & NUT COMPANY, *Erie, Pa.* • WILEY MANUFACTURING COMPANY, *Mountville, Pa., and Port Deposit, Md.*

make blade selection
a cinch
not a search!



use the new
VICTOR WALL CHART

You'll see the name of the blade you want to use—hand, power or band saw—opposite the type of material you want to cut. You'll see this valuable information quickly, easily, when you tack the new Victor wall chart over your tool crib or in your machine shop.

What's more you'll get a lot of inside tips on how to get longer life, the best use, from every blade . . . There are plenty of ways to cut costs, make money, on this new Victor Wall Chart . . . It's printed clearly, attractively, and it's yours absolutely FREE.

Drop in on your Victor supplier — or send him a card, today. *The supply is limited.* Also see him the next time you want the finest in cutting performance. He carries a full line of Victor blades — one for every job a hack saw or a band saw can do. Victor blades cut better, too, on metals, plastics, and other nonmetallics . . . cut faster, cleaner, last longer.

3708
VICTOR SAW WORKS, INC.
MIDDLETOWN, N. Y., U. S. A.
Makers of Hand and Power Hack Saw Blades, Frames and Band Saw Blades

Fatigue Cracks

BY C. T. POST

Mature Hit

• • After enduring for weeks the jive and hep cat renditions of that ubiquitous tune "Nature Boy," we're glad to hear from Hollywood that the tunesmiths are working on an arrangement for middle aged listeners to be released under the title "Serutan Yob."

History

• • Visitors to Chicago's grimy industrial west side, strictly twentieth century in atmosphere, always blink twice at a delicate Williamsburg colonial palace rising near the railroad tracks on West Hubbard St. The architectural lines are authentic to the most minute detail, and only the nameplate on the door, that of Lindberg Engineering Co., indicates that the building houses one of the country's unique industrial plants.

When the architects had completed the working drawings for the building, complete with a lacy oval staircase rising from a foyer lit by a crystal chandelier, and the interior decorators had placed orders for lobby furniture of designs favored by 18th century Virginia gentlemen, it was discovered that 20th century Chicago bricks would be out of place. Lindberg solved that one by sending scouts to Virginia where they successfully recruited two hoary brickmakers learned in the ways of making bricks of a shape and texture suited to a colonial palace.

What we're leading up to is not that Lindberg has a modern factory for making heat treating furnaces to the rear of its palace, but that this architecturally minded firms has clasped still others of the arts to its bosom. A few years ago, the best vocal talent at Lindberg and its affiliates, Lindberg Steel Treating Co. and Wheelco Instrument Co., got together to sing Christmas carols. Out of this came a permanent organization. The next Spring they gave a minstrel show, then a full fledged musical revue in a downtown theater. This year's show was a Western. The vaquero you see here, for instance, is L. A. Lindberg, president of the company, who drummed up interest for the show as a barker. For some reason, though, the troupe never has presented a show with a colonial Williamsburg setting.

Science

• • A San Francisco physician of our acquaintance, tops in his profession, finds his relaxation in dreaming up mechanical gadgets to make life easier for his fellow man. His luxurious home, built on an arm of land jutting into San Francisco Bay near the Golden Gate, is the acme of automaticity.

Until recently, though, one point troubled him. Returning from emergency calls late at night, he found it difficult to stop his car at the precise point in the driveway where he could easily reach out and push the motor control switch which made his overhead garage door roll up and open.

It took only a little thought to hit on the idea of moving the switch to the garage door itself where it could be actuated by a light sensitive cell. The cell was set at a proper height to catch the beams of the car headlights, and visored to keep out miscellaneous lights. To polish off the operation the doc fixed it so that exactly two minutes after the door was rolled overhead by the flash of the headlights, it rolled itself down automatically.

The thing worked like a charm for the first few months. The medico dreamed of putting it into quantity production and retiring from medicine. Then one September as guests were sitting down to 7 p.m. supper, listening to our friend boast of his gadget, conversation suddenly stopped. The sound of the garage doors rolling up and open was unmistakeable. The guests watched the host's strained face as, two minutes later, the doors could be heard rolling down again. But, almost immediately, they were rolling up again. At this, the doc jumped to his feet, ran to the outside door alongside the driveway, and threw it open. He was blinded by the horizontal rays of the setting sun, which sinks into the sea directly off the Golden Gate a few gorgeous evenings twice a year.

you name it—

The new Airco 700 Welds It ...from thin metal to 2" plate

Why? Because this new torch is available with a selection of tip assemblies that range all the way from Size 00 through the large No. 10 size.

This wide tip selection makes the Airco 700 suitable for your welding work — from thinnest sheet metal up to sections 2″ in thickness. When equipped with a multiflame tip, this torch is tops for silver and aluminum brazing.

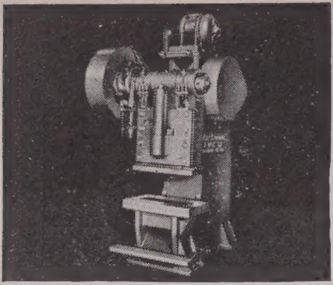
Each welding tip is assembled with an individual mixer drilled for that particular tip. In addition to wide operating range, other features of the "700" are: better flame control . . . perfect balance . . . and low maintenance cost.

With the addition of a cutting attachment, the Airco 700 can be easily converted to handle general shop cutting work.

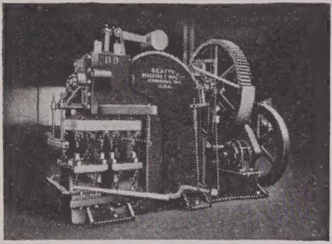
If you would like more information about this torch, or a free demonstration right in your own shop, address Dept. I A 8468, Air Reduction, 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas. On West Coast: Air Reduction Pacific Company, San Francisco 4, California.

AIRCO **AIR REDUCTION**
Offices in All Principal Cities

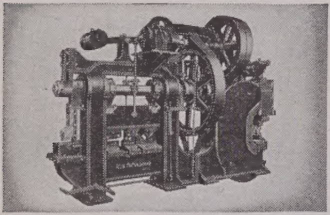
Headquarters for Oxygen. Acetylene and other Gases . . . Carbide . . . Gas Welding and Cutting Machines, Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories



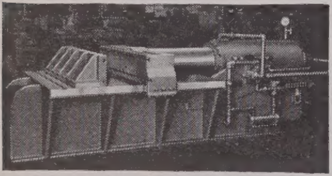
BEATTY Single End Punch available in capacities up to 200 ton.



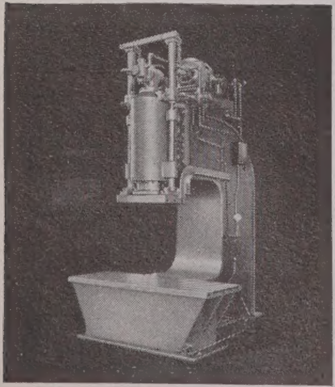
BEATTY No. 11-B Heavy Duty Punch for production tooling and use with BEATTY Spacing Table.



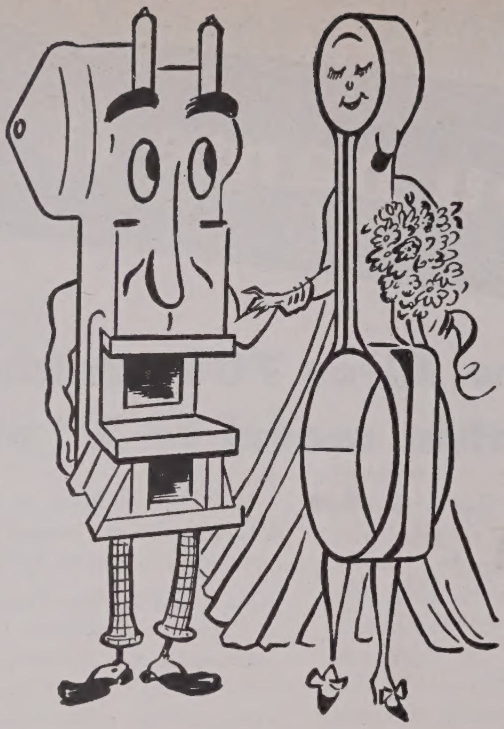
BEATTY Co-Pun-Shear — one unit does coping, punching, shearing.



BEATTY Horizontal Hydraulic Bulldozer for heavy forming, flanging, bending.



BEATTY 250-ton Gap Type Press for forming, bending, flanging, pressing.



SHOTGUN WEDDING

Fast, low-cost production today demands machines correctly designed, correctly tooled for the specific job to be done. It *demands perfect mating* of machine to job, and this calls for the best engineering experience available to you. Here is where BEATTY ENGINEERING comes in. We know there is a BETTER way to do most production jobs. Our broad experience in finding that better way for so many companies is assurance that we can contribute to the solution of your problems. Write or phone us about your needs. Your best insurance for fast, quality production at a competitive cost is a BEATTY machine engineered to your specific needs.

THERE'S A BETTER WAY TO DO IT!

HYDRAULIC HEAVY METAL WORKING EQUIPMENT

BEATTY MACHINE AND MFG. COMPANY
HAMMOND, INDIANA

Dear Editor:

ROLLING MILL WAGES

Sir:

I am writing in the hope that you can furnish us with a book governing wages in rolling mills. We have one, but it is quite old and we do not know whether prices which are quoted are still in effect. The book we have is "Western Scale of Prices Governing Rolling Mills."

M. SIDIK
Financial Secretary

Selkirk Rolling Mill Workers' Federal Union No. 120
Selkirk, Manitoba

• We don't have a copy of the complete rolling mill wage scale here, but Vincent Sweeney, Educational Director, United Steelworkers of America, Pittsburgh can supply you with one, or the Bureau of Labor Statistics, U. S. Dept. of Labor, Washington, can give you the information.—Ed.

MANAGEMENT BOOK

Sir:

We are desirous of obtaining a copy of your book titled "Practical Management."

L. Z. SAJOR
Research Library

Sonotone Corp.
Elmsford, N. Y.

• Copies are available at $3.00 each.—Ed.

BAR BENDERS

Sir:

Will you be kind enough to send us a list of manufacturers of power driven machines used for bending reinforcing bars.

J. A. SMITH

Smith-Stewart Co.
Newburgh, N. Y.

• A list of companies making such machines has been mailed.—Ed.

WELD METAL COMPOSITION

Sir:

Please send us more information on your mention of a graphical method for predicting weld metal composition and structure in the May 18th Newsfront section.

R. J. McCALLIAN

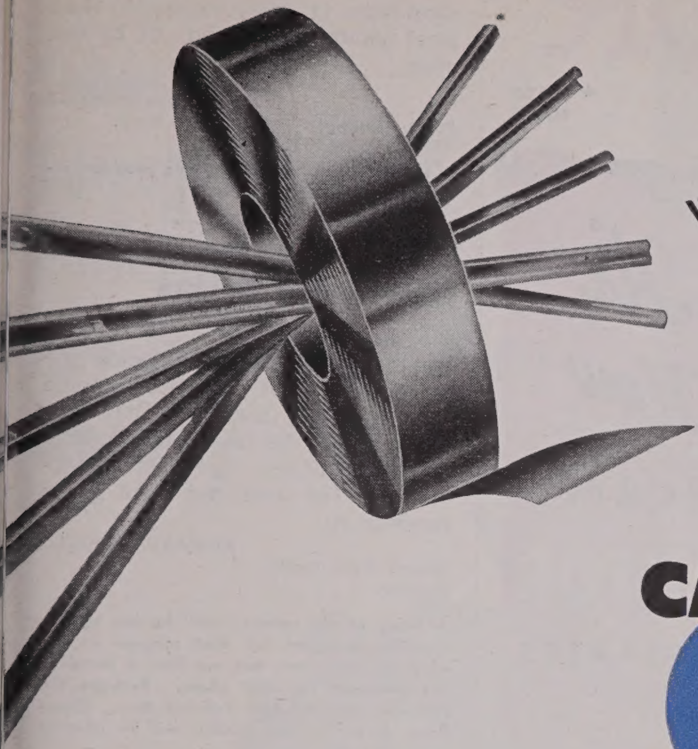
Industrial Metals & Chemicals Co.
New York

• A technical article giving detailed information on the subject is tentatively scheduled for the July 1 issue.

SOUTH AMERICAN BUYER

Sir:

We would appreciate receiving a list of manufacturers producing:



develop your "Bright Idea" with

CMP stainless THINSTEEL

TRADEMARK

NOW AVAILABLE IN Bright ANNEALED 18-8 AND OTHER CHROME-NICKEL GRADES FOR THE FIRST TIME

There's sales appeal with Thinsteel — and particularly with Stainless Thinsteel. For CMP has now broadened your planning horizon by making available for the first time from any source another new stainless product — light gauge 18-8 and other chrome nickel grades with bright mirror finish even in dead soft annealed temper. Here's increased utility, sparkling beauty and another big advantage in reduction of polishing and finishing costs. Does it suggest an application in your product? Perhaps you would like to explore its possibilities. We will be glad to send you a sample and offer our assistance in helping you plan its use for any application where a light gauge metal with corrosion resistance and beauty of appearance is important.

COLD FACTS ON THINSTEEL

- EXTRA LONG COILS *...less downtime*
- EXTREMELY CLOSE TOLERANCES *...more parts per ton*
- WIDE RANGE OF PHYSICALS AND ANALYSES *...tailored for your products*
- GAUGES THIN AS .001" *...strength with lightness*

C M P PRECISION COLD ROLLED STRIP STEEL

the Cold Metal Products co.

YOUNGSTOWN 1, OHIO

NEW YORK • CHICAGO • DETROIT • ST. LOUIS • BUFFALO • INDIANAPOLIS • LOS ANGELES • SAN FRANCISCO

VALIMITOR*

(VOLT - AMPERE - LIMITOR) * TRADE MARK

For 2300-4600 V. Motors

LIMITS "FAULT" CURRENTS TO 25,000 KVA
(steady state current)

These VALIMITOR Starters may be used *with safety* at *any* point on *any* power system regardless of the available KVA. Even if connected to a bus of *infinite* capacity, the short circuit KVA will be limited to a value easily interrupted by the starter-contactor.

Because VALIMITOR Starters limit the maximum possible fault current to approximately 25,000 KVA, damage to a short-circuited motor is limited. Also limited is the electro-magnetic forces on the starter, bus, cables and the entire high voltage system back to the power source.

There is nothing to replace, when a fault occurs. The magnetic overload relays on the VALIMITOR Starter promptly open the *high arc-rupturing capacity starter-contactor* to clear the line. *Don't worry* about the short-circuit possibilities your motor drives may be subjected to—*now or at some future date.*

For a specific problem, tell us --

1-Type of motor (squirrel-cage,wound-rotor or synchronous)
2-HP, voltage, phase and frequency
3-Type of starter—*reduced* or *full* voltage starting—combination type or without disconnects.

NOTHING TO REPLACE . . . NO CHANGE LATER ON

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79th STREET • CLEVELAND 4, OHIO

(1) Galvanized and black steel sheets, (2) galvanized and black steel pipe, (3) black enameled rigid steel conduit pipe, and (4) barbed wire.

F. G. RUGGLES
Vice President
South American Procurement Corp.
New York

• Lists of manufacturers of the products indicated have been sent.—Ed.

DISAPPEARING GRINDER

Sir:

I have been trying to locate the manufacturer of a vertical spindle hole grinding machine that was exhibited at the 1947 Machine Tool Show in Chicago. I requested literature at the time, but have never received it.

EDWARD FABISH
Illinois Tool Works
Chicago

• None of the editors recall having seen a machine designed for that purpose at the Chicago show, nor can we find it listed in the program for that show. Perhaps the National Machine Tool Builders Assn., Cleveland, or one of our readers will be able to help you.—Ed.

ANALYTIC PROCEDURES

Sir:

We would like to obtain copies of the articles "Color Determination of Tungsten, Tellurium and Columbium" from the April 4, 1946 issue and "Determination of Tungsten and Columbium in Stainless Steels" from the April 11, 1946 issue.

I. H. MacPHERSON
Metallurgical Dept.
Atlas Steel Ltd.
Welland, Canada

• Tearsheets have been sent.—Ed.

PUMPING MOLTEN METAL

Sir:

We would appreciate receiving a reprint of the article "Electromagnetic Pumping of Molten Metals" from the Dec. 4, 1947 issue.

PAUL R. BABYAK
Permanent Mold Services
Wickliffe, Ohio

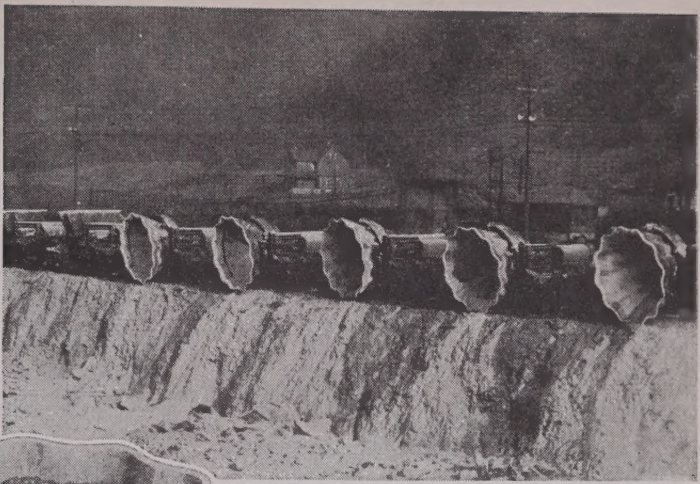
• A copy has been mailed.—Ed.

THESIS INFORMATION

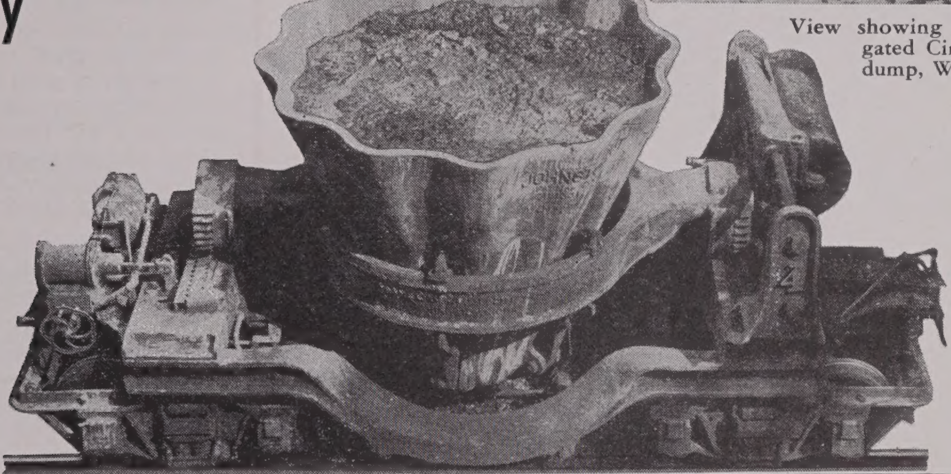
Sir:

In connection with a thesis I am writing at Tulane University, I would like to obtain a copy of the article "Choosing the Consulting Engineer" from the July 5, 1945

Johnston Corrugated Cinder Pot Performance Key to Slag Handling Economy



View showing Johnston Corrugated Cinder Pots at slag dump, Weirton District



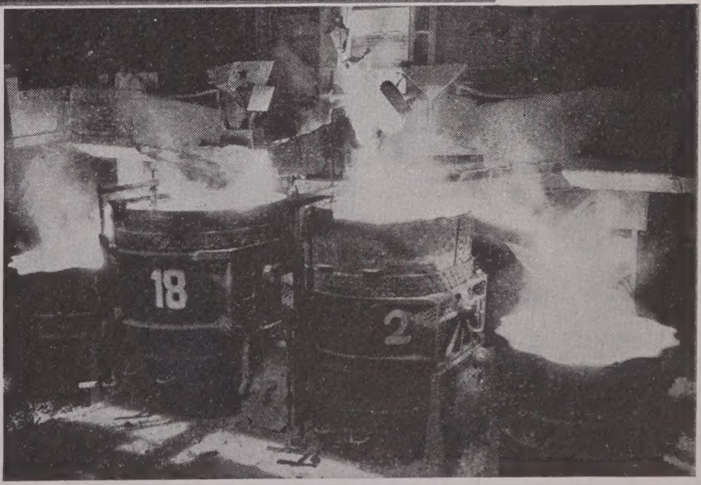
Close-up of Johnston Corrugated Cinder Pot

Continuous Developments Increase Service Life of Johnston Corrugated Cinder Pots

Slag Handling is expensive business—part of the cost of every ton of steel. But when you apply Johnston Corrugated Cinder Pots and Slag Handling Equipment you'll find their performance an important factor in keeping slag disposal at the lowest cost-per-ton of steel produced.

Every Johnston Corrugated Cinder Pot is engineered for its specific job. That's why they establish records for heat-hours of service life—why they are so economical for use in blast furnace or open hearth slag disposal operations.

Then, too, you'll find that our engineers are constantly developing and improving methods and equipment for more efficient slag handling. This continuing research is reflected in reduced slag disposal costs when you adopt Johnston Corrugated Cinder Pots and Slag Handling Equipment.



Tapping a 480 ton open hearth heat in two 250 ton ladles, the slag being handled by two 400 cubic foot Johnston Corrugated Cinder Pots

Don't forget that it pays to *keep your eye on what's new at Mack-Hemp.* Just write or phone and we'll show you how we can expedite your slag handling by installing this modern equipment.

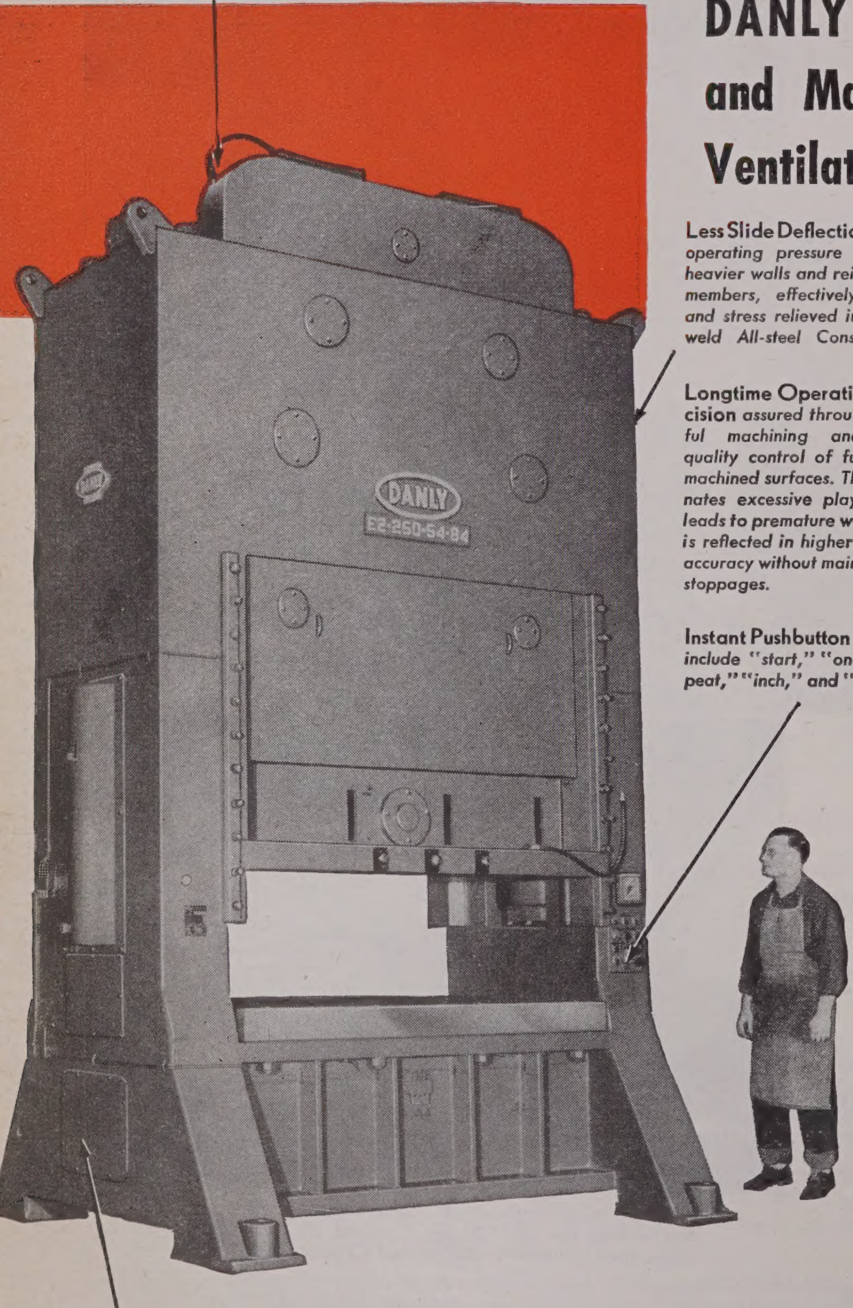
MACKINTOSH-HEMPHILL CO.

PITTSBURGH AND MIDLAND, PA.

8,000,000

DANLY PRESSES Cut Production and Maintenance Costs with New Ventilated DANLY CLUTCH

Danly Clutch *designed for repetitive engagements under severe operating conditions of power press work. Long service life of this vital press mechanism offers major reduction in maintenance. (See detail on page opposite.)*



Less Slide Deflection *under operating pressure due to heavier walls and reinforcing members, effectively joined and stress relieved in Danlyweld All-steel Construction.*

Longtime Operating Precision *assured through careful machining and rigid quality control of functional machined surfaces. This eliminates excessive play, which leads to premature wear, and is reflected in higher product accuracy without maintenance stoppages.*

Instant Pushbutton Controls *include "start," "once," "repeat," "inch," and "reverse."*

Down-time because of clutch maintenance, a major factor in controlling production costs in power press operations, is greatly reduced with Danly Presses equipped with the new ventilated air friction clutch. The new clutch, illustrated at right, is one of the reasons why Danly Presses give longer service with little maintenance attention.

A continuous engagement test recently completed is proof of the superior performance of the Danly Clutch. After more than 8 million engagements, run night and day for a period of 1½ years under simulated press conditions, the disc faces of the Danly Clutch measured less than one-thousandth of an inch of wear per 100,000 clutch engagements. Other components similarly indicated unusual endurance. Air-cooled, low-starting torque, and complete automatic pressure lubrication are vital features which now offer new possibilities for press applications for the production of parts.

These new developments are characteristics of Danly progress in press engineering.

engineering service

For assistance in determining the most efficient press for your own type of stampings, call on Danly engineers. Send details about your problems.

Without obligation, you will receive specific recommendations how production costs can be reduced.

Continuous Pressure Lubrication *keeps press inoperable until working pressure is built up in circulating oil system. Each gear, bearing and driving member in the crown and slide is continuously bathed in clean filtered oil.*

Faster Setups *are permitted by a reversible pushbutton control which withdraws punch from die at any point in the stroke. This also adds safety to trial strokes when trying out new dies.*

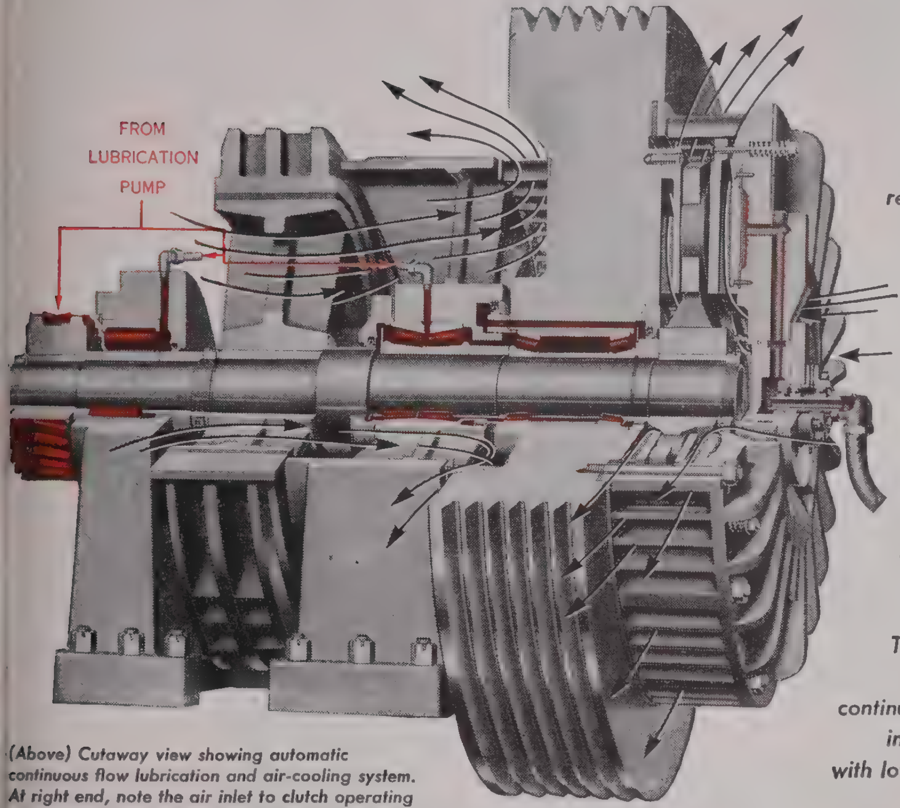
DANLY PRESS CONSTRUCTION=

Faster Setups . . . Less Maintenance

. . . More Production

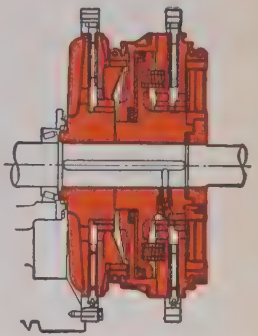
DANLY

PRESS CLUTCH ENGAGEMENTS
. *under load* with negligible wear



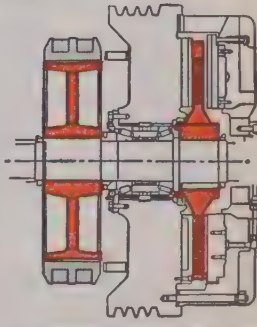
(Above) Cutaway view showing automatic continuous flow lubrication and air-cooling system. At right end, note the air inlet to clutch operating diaphragm. Multiple friction discs float in clutch spider when disengaged. Brake shoes in drum at left are spring-engaged and air-released automatically.

Cross sectional outline of conventional clutch shows relative proportion of components subject to acceleration (indicated in red).



conventional type press clutch

Note the smaller mass of accelerated components in the Danly Clutch. The larger mass (not shown in color) in continuous rotation results in easier acceleration with lower starting torque.



new Ventilated Danly Clutch

Danly Press and Clutch Features Reduce Press Down-Time

Construction features of the Danly Clutch offer specific reasons why Danly Presses cost less to operate and produce more stampings over a given period.

★ **Long Life of Friction Discs** is assured because of the low starting torque of Danly Clutches. Low-energy clutching characteristics have been achieved by a new design which requires less than one-fifth the mass in clutch components subject to acceleration, as compared to conventional press clutches.

★ **Cool Operation** further reduces wear of friction discs and provides protection of the antifriction bearings from overheating. The clutch housing itself is a cooling fan which provides high velocity ventilation through internal ports adjacent to areas where heat is generated.

★ **Automatic Pressure Lubrication** circulates clean, filtered oil to each bearing *including the flywheel bearings.* There are no grease fittings requiring periodic attention of the operator.

★ **Instant Pushbutton Activation** is produced by compressed air controlled by an electric solenoid valve.

★ **Simple Disassembly** permits inspection of parts subject to wear. This can be done in only a few minutes. It is unnecessary to dismantle entire clutch to make infrequent replacements of worn parts.

DANLY MACHINE SPECIALTIES, INC.
2100 SOUTH 52ND AVENUE, CHICAGO 50, ILLINOIS

free **get this catalog**

Write TODAY for valuable literature illustrating and explaining features of and suggesting profitable uses for Danly Presses. Standard Press Models available from 50 to 1,500 tons.

issue. I would appreciate any advice you can give on other articles, books, or references about management consulting, especially in labor and industrial relations work.

WALTER R. SMITH

New Orleans

• **Tearsheets of the article have been sent. The book "Practical Management," a collation of IRON AGE articles dealing with management problems and techniques would be of value to you. Copies are $3.00.—Ed.**

GEAR HOBBING MACHINES

Sir:

We wish to procure the names and addresses of manufacturers making gear hobbing machines.

J. R. COUTTS

Coutts Machinery Co., Ltd.
Edmonton, Alberta

• **List of companies has been sent.—Ed.**

TEXTBOOK STATISTICS

Sir:

To assist us in preparing the third edition of "Mine Examination and Valuation", have you an index of pig iron production in the U. S. for the period 1900 to date?

ROLAND D. PARKS
Associate Professor of Mineral Industry

Massachusetts Institute of Technology
Cambridge, Mass.

• **Tearsheets from our Jan 1, 1948 and our Jan. 1, 1932 issues showing the monthly production figures from 1900 to date have been sent. You will notice that the tearsheet from the 1948 issue shows the figures in net tons while that from the 1932 issue shows gross tons.—Ed.**

HAIRPIN HOOK

Sir:

We are interested in securing what is known by mills and warehouses as a hairpin hook used to lift and move steel coils by crane. We have been unable to locate a manufacturer of this item and wonder if you can help us.

H. L. LINDBURG

Great Western Steel Co.
Chicago

• **A list of companies supplying such hooks has been mailed.—Ed.**

PRICE CORRECTION

Sir:

There is information on p. 117 of your May 20th issue regarding a price advance by our company which is not in accordance with

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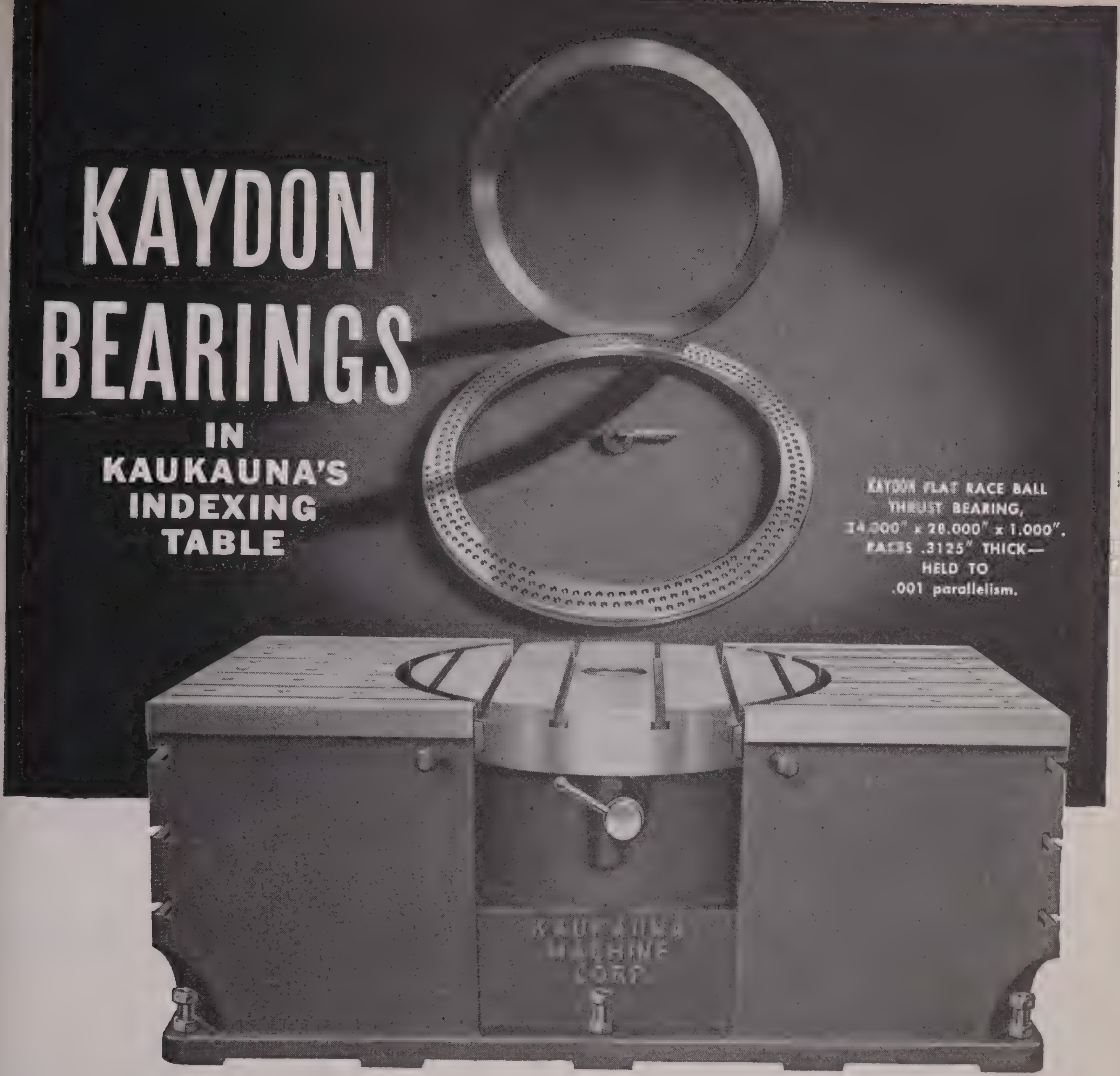

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the facts. It is quite true that we did advance certain prices recently, but it is not correct to say that the advance amounted to 35¢ on all the products listed, as the 35¢ increase applied only to nails and staples.

J. M. ELLIS
Chief Clerk

Dominion Steel & Coal Corp., Ltd.
Montreal

• THE IRON AGE article incorrectly showed the 35¢ per 100 lb. advance to have applied to wire, bale ties, reinforcing steel, drift bolts and bedstead angles.—Ed.

HEAT RESISTANT ALLOYS

Sir:

We would appreciate receiving, for the use of our Technical Section, two sets of tearsheets of the three part article "A Summary of Heat Resistant Alloys from 1200° to 1800° F" from the March 18, April 8 and 15 issues.

L. T. JILK
Mgr., Technical Section

E. I. duPont de Nemours &
Co., Inc., Sabine River Works
Orange, Texas

BERYLLIUM COPPER

Sir:

Will you please send us a copy of the article "Heat Treating Beryllium Copper for Peak Performance" from your Dec. 6, 1945 issue.

GEO. E. CHANIOT
Chief Engineer

A. W. Cash Valve Mfg. Corp.
Decatur, Ill.

• Tearsheets have been mailed.—Ed.

STRAIN AGING

Sir:

We would appreciate receiving sets of tearsheets of two articles from the May 13 issue. The articles are: "Quality Control of Aluminum Sheet" and "Strain Aging Criteria."

M. L. RAUSCH

Selas Corp. of America
Philadelphia

WIRE FORMING EQUIPMENT

Sir:

Please advise us on the name of a manufacturer making an instrument for brazing or welding electri wires together. Also, the name of a manufacturer making an instrument for insulating the wire afte it has been brazed together.

CHARLES S. SCHOFIELD

Schofield Hardware Co., Inc.
Florence, S. C.

• Sources of brazing furnaces and ligh brazing units have been mailed. The type of insulation desired will determine the type of coating or forming equipment you wil want.—Ed.

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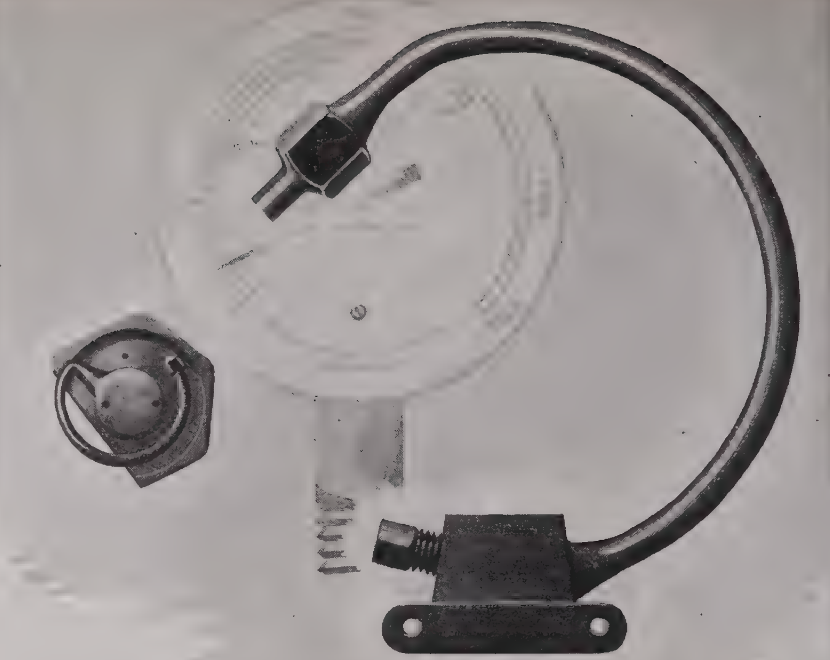

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Steel Hard to Get?

Demand Still Exceeds Supply But . . .

. . . this is a typical view of night loading operations at a Ryerson steel-service plant. The steels specified on several orders are on their way to a loading platform for delivery the following morning. Possibly none of these orders are completely filled—however, the fact remains, we are doing our very best to serve a large group of steel users.

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Boom Psychology

THE country is in the midst of a typical boom period. Every glass of water tastes like champagne. Each item in the press, however drab or sombre, is "constructive." "War" or "oil" or "inflation" brings a rising volume of outside funds into the stock market.

These are familiar signs of a peculiar and ebullient psychology. They also mean "Stop, look and listen" to the wary. Preparation for war may indeed add to the volume of business. Inflation certainly means higher prices. To say that a rising level of business and mounting market prices mean prosperity and well-being is conclusion-leaping of the most questionable variety.

In the first place it is not at all certain that war orders, plus foreign aid, will actually produce a higher volume of business. Counting the latest defense appropriations by Congress, the total outlay of $14 billion for military purposes is approximately 6% of the current national product. The $6 billion allocated to ERP - assuming it sticks - is only 2½% of the country's gross annual output. A modest change in consumption, a slight alteration in the schedule of capital construction by business and individuals, will offset the total of extraordinary expenditures. Avid, reckless buying is running its course. Saturation is already apparent in a number of fields. The war scare this spring momentarily stimulated jaded consumer appetites. This spurt was definitely made on business borrowed from the future.

Volume today is almost twice the prewar level. No reasonable hypothesis of natural growth can justify such a level at this time. Corrections have always occurred in the past and the prudent man must assume that they will occur again.

Inflation is an illusory prop of business and speculation. In the days of complete laissez faire, rising money pressures first affected raw material and manufactured products. Only when higher values had been established did the costs of business - labor particularly - catch up with the price parade. The lag created an economic wonderland in which everyone seemed to be making money and no one could lose.

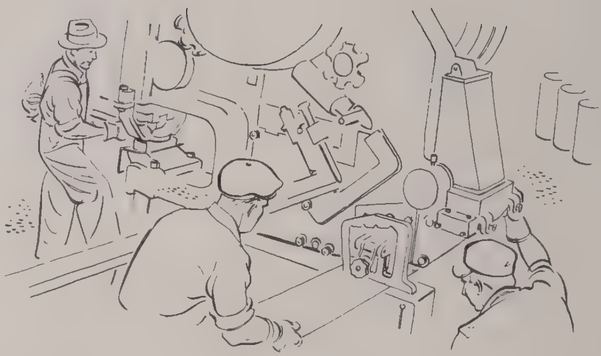
As any businessman knows, this is no longer true. During the inflationary periods of the recent past, it is costs which have moved up first, followed at delayed intervals by the price of finished products. Only extraordinarily high volume has enabled business to show the profits which have been reported. Even then, reported profits have often failed to reflect fully the increase in costs.

The power of labor has effectively eliminated any drag in costs which adversely affects its interest. Indeed the argument of inflation, as we have seen repeatedly in recent months, has done yeoman service in rationalizing labor demands which otherwise might have been forced to rest - as indeed they actually do - on raw power loaded with license. The facts indicate that the prospect of inflation is bearish, since it distorts in anticipation cost factors which otherwise might remain stable.

Inflation and war are no longer the sure buttresses of prosperity - if they ever were.

Joseph Stagg Lawrence

"I like the UNIFORMITY of Inland Steel"



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NEWSFRONT

► The turmoil over the basing point system has opened old sores between steel companies and their customers. Steel users are still mad at those companies who have pulled out of distant territories. Furthermore, they are becoming increasingly aware that their costs are so divergent on some steel products because of freight and long hauls that they are worrying over their own finished prices. Steel companies point out that wages, freight and other costs make it impossible to absorb the amount of freight that used to be absorbed "in the old days."

► Light weight, corrosion and impact protection are featured in a new type elastic package container developed especially to protect jet engines for shipping and storage. A "free-breathing" vapor barrier is mounted on a castered handling stand and then engaged in a light metal structure with exceptional shock absorbing characteristics.

► Canadian production of cold rolled sheets will be augmented by tonnage from the Steel Co. of Canada's new cold strip mill, probably in the fourth quarter of this year. However, tonnage produced from this mill will not increase the total amount of steel available to consumers in Canada. The cold strip can only be made by the company if they deprive their hot rolled sheet mills, and possibly bar mills, of tonnage which they are presently consuming.

► Some educated crystal-ball gazers are predicting that titanium will likely become a common structural material at some future date, with atomic energy generation spearheading its development for this use.

► The Welding Research Council will soon publish a report on aluminum showing the exact amount of power and welding speed required for aluminum flash welding. Flash welders will be able to consult standard charts and determine whether a given machine will do the job. It is hoped to make the same kind of data available for flash welding of steel.

► The British "turbo cars" will have no pistons, no spark plugs, no radiator and no clutch. The new engine will be self-cooling and is reported to run on diesel oil, gasoline or paraffin. The engine will be ready for mass production in 1950, say its inventors.

► Production of all types of aluminum windows is booming and manufacturers are getting a bigger bite of the market for double-hung house windows. One reason is they are a dollar or so cheaper than wood and require no painting. The latter costs union builders at least $6 a window.

► Transfer of the Borsair Co. (Italy), highway and railroad constructors, to the Argentine will be the first accomplishment of that nation's recently created National Commission for the Establishment of Industries. Feelers have been put out looking to the transfer of at least one, if not two, Italian automobile factories in toto to the Argentine.

► Another company has bought into the ingot business in Pennsylvania--adding about 3000 tons a month to the 3000-ton production brought in near Pittsburgh early this month.

► Fear has already been expressed by some exporters over recent inroads made by Britain and Belgium in the U.S. export market in South America. In Brazil, Colombia and Argentina, U.S. exporters have lost orders to England for several thousand tons of steel. They admit the tonnage is small, compared with the 6.5 million tons exported by the U.S. last year, and an equal or higher tonnage expected this year. But they object to limitations on exports at the same time Britain is receiving ERP steel and boosting her steel export business.

► The Navy is beginning to lift the veil of "secrecy" surrounding some of its developments. A recent display included the ram jet engine and the proximity fuse, in addition to torpedo mechanisms among the most complicated known to man. The gyros, brain of the torpedo, which require tolerances of 0.00000 1/32 in. were included in the display.

► Polish steel mills will receive machinery and equipment for modernization from Russia. Construction has already started on Nowa Huta, which is expected to produce 1.7 million tons per year (more than the combined output of all other Polish foundries).

New Temper Designations for Aluminum Alloys

* * *

By R. B. SMITH

Technical Adviser,
Reynolds Metals Co.,
Louisville

* * *

A SYSTEM of designations for the various tempers of cast and wrought aluminum alloy products grew up with the industry, but the system has proved inadequate to define the many tempers now being produced. To meet present and future requirements the system has been modified, and the modified system is now being used by the industry for both wrought and cast aluminum alloy products. No changes have been made in the temper designations of cast products, but some have been changed for wrought products. The new basic temper designations for wrought and cast products are listed in table I. Tables II and III list both the old and new temper designations for commercial wrought aluminum alloy products, and tables IV thru X show the corresponding mechanical properties.

The principle of the nomenclature system remains the same: the temper designation follows the alloy designation and is separated from it by a hyphen. As before, the letters *F*, *O*, *H*, *W*, and *T* are used to designate basic tempers. Subdivisions of the basic tempers, where required, are indicated by one or more digits following the letter. These designate a specific sequence of basic treatments, but only those operations which are recognized as materially influencing the characteristics of the product are indicated. Should some other variation of the same sequence of basic operations be applied to the same alloy, resulting in different characteristics, then additional digits are added to the designation. As now used, the basic temper designations and the sub-divisions are listed in Table I. These are more fully defined and explained as follows:

-F—*As-fabricated.* This designation applies to products which acquire some temper qualities in the shaping processes but are not subsequently thermally treated or intentionally strain-hardened. Non-heat-treatable alloy

TABLE I

The New Basic Temper Designations for Wrought and Cast Aluminum Alloy Products

—F	As-fabricated.	
—O	Annealed, recrystallized (wrought products only).	
—H	Strain-hardened.	
	Subdivisions of the —H temper:	
	—H1	Strain-hardened only.
	—H2	Strain-hardened and then partial annealed.
	—H3	Strain-hardened and then stabilized.
—W	Solution heat-treated—unstable temper.	
—T	Treated to produce stable tempers other than —F, —O or —H.	
	Subdivisions of the —T temper:	
	—T2	Annealed (cast products only).
	—T3	Solution heat-treated and then cold-worked.
	—T4	Solution heat-treated.
	—T5	Artificially aged only.
	—T6	Solution heat-treated and then artificially aged.
	—T7	Solution heat-treated and then stabilized.
	—T8	Solution heat-treated cold-worked, and then artificially aged.
	—T9	Solution heat-treated, artificially aged, and then cold-worked.
	—T10	Artificially aged and then cold-worked.

In an effort more adequately to define the many tempers in which aluminum alloys are now available, temper designations covering these products have recently been modified by the major producers. A description of these new temper designations is given in this article, together with a table for conveniently converting from the old to the new designations.

TABLE II Temper Conversion Table for Non-Heat-Treatable Wrought Aluminum Products[1]

Alloy			Present Temper Designation		
ASTM Designation	Commercial Designation	Former Temper Designation	Strain-Hardened Only	Strain-Hardened and then Partial Annealed	Strain-Hardened and then Stabilized
A2...... M1.......	2S........ 3S........	—¼H —½H —¾H —H Extra-Hard	—H12 —H14 —H16 —H18 —H19	—H22 —H24 —H26 —H28	....
MG1..... GR1.....	4S .... 52S........ 56S........	—¼H —½H —¾H —H Extra-Hard	....	....	—H32 —H34 —H36 —H38 —H39

[1] Products available in these tempers and —O temper are sheet, wire, and round drawn tubing. Plate, rod, bar, extruded products, and drawn tubing other than round are available only in —O temper and —F temper.

TABLE III Temper Conversion Table for Heat-Treatable Wrought Aluminum Products

ALLOY			PRESENT TEMPER DESIGNATION													
			Sheet and Plate[1]					Wire, Rod and Bar[1]—rolled or cold-finished	Rolled Structural Shapes[1]	Extruded Rod, Bar, Shapes, Tubing and Pipe[1]		Drawn Tubing and Pipe[1]		Forgings[2]	Rivets	
			Flat Sheet		Coiled Sheet	Plate										
ASTM Designation	Commercial Designation	Former Temper Designation	Heat-Treated by Producer	Heat-Treated by User	Heat-Treated by Producer or User	Heat-Treated by Producer	Heat-Treated by User	Heat-Treated by Producer	Heat-Treated by Producer or User	Heat-Treated by Producer	Heat-Treated by User	Heat-Treated by Producer	Heat-Treated by User	Heat-Treated by Producer or User	Heat-Treated by Producer or User	Driven Rivets
CP21.....	11S..........	—W —T3 —T8	....	....	....	....	....	—T4 —T3 —T8	....	....	....	....	....	....	....	....
CS41..... Clad CS41[7]	14S Hard Clad R301[7] Alclad 14S[7]....	—W —T —T	—T3 —T6	—T4 —T6	—T4 —T6	—T4 —T6	—T4 —T6	—T4 —T6	—T4 —T6	—T4 —T6	—T42 —T62	....	....	—T4 —T6 —T61[3]	....	....
CM21....	17S	—T —T —T	....	....	....	....	....	—T4	—T4	—T4	—T42	—T3	—T4	—T4	—T4	—T3[4] —T31[5] —T41[6]
....	A17S........	—T	....	....	....	....	....	....	....	....	....	....	....	....	—T4	—T3[4]
CM41....	R317.........	—T	....	....	....	....	....	—T4	....	....	....	....	....	....	....	....
....	18S..........	—T	....	....	....	....	....	....	....	....	....	....	....	—T61[3]	....	....
CG21.... Clad CG21[7]	24S Pure Clad 24S[7] Alclad 24S[7]....	—T —RT —T80 —T81 —T86	—T3 —T36 .... —T81 —T86	—T4	—T4 .... —T6	—T4 —T36 .... —T86	—T42	—T4 —T36	....	—T4	—T42	—T3	—T4	....	—T4	—T31[5]
....	25S..........	—T	....	....	....	....	....	....	....	....	....	....	....	—T6	....	....
....	32S..........	—T	....	....	....	....	....	....	....	....	....	....	....	—T6	....	....
....	A51S.........	—W —T	....	....	....	....	....	....	....	....	....	....	....	—T4 —T6	....	....
GS22.....	R353.......... 53S..........	—W —W —T —T5 —T61	....	....	....	....	....	....	....	—T4 .... —T6 —T5	—T4 .... —T6	....	....	—T4 .... —T6	—T4 .... —T6 .... —T61	—T4 —T41[6] —T6 .... —T61
GS21.....	R361.......... 61S..........	—W —T —T5 —T62 —T81 —T7	—T4 —T6	—T4 —T6	—T4 —T6	—T4 —T6	—T4 —T6	—T4 —T6 .... —T81 —T91	—T4 —T6 .... —T62	—T4 —T6 —T5 —T62	—T4 —T6 .... —T62	—T4 —T6	—T4 —T6	....	.... —T6	.... —T6
GS1......	63S..........	—T —T5	....	....	....	....	....	....	....	—T6 —T5	—T6 —T5	....	....	....	....	....
ZG42 ... Clad ZG42[7]	75S .... Alclad 75S[7]....	—W —T	—W[8] —T6	—W[8] —T6	—W[8] —T6	—W[8] —T6	—W[8] —T6	.... —T6	....	—W[8] —T6	—W[8] —T6	....	....	....	....	....

[1] Products listed are also available in —O and —F tempers.
[2] Forgings are also available in —F temper.
[3] Boiling water quench.
[4] Driven cold after full aging.
[5] Driven cold immediately after solution heat-treatment, or when refrigerated to defer natural aging.
[6] Driven hot, at the solution heat-treating temperature.
[7] Available only in sheet and plate.
[8] To be specific, the time of natural aging must be stated, for example, 75S-W (2 hr.), 75S-W (2 mo.).

plate, rod, bar, extruded products, and drawn tubing other than round are produced in this temper instead of in the -H tempers since the amount of strain-hardening cannot be closely controlled and will vary with the size of the section. Some heat-treatable wrought alloy products are also produced in this temper, but are subsequently heat-treated by the user. Minimum mechanical properties are not customarily specified for wrought products in this temper, but they can be specified for extruded products in alloys 53S or R353 and 63S.

-O—*Annealed, recrystallized.* This designation applies to the softest temper of wrought alloy products. Material in this temper has better formability than in any other temper. All wrought products can be furnished in this temper, but they are usually converted to another temper by the user.

-H—*Strain-hardened.* This designation applies to those products which have their strength increased by strain-hardening with or without supplementary thermal treatments to produce partial softening. The *-H* is always followed by two or more digits. The first digit indicates the specific combination of basic operations, and the following digit or digits the final degree of strain-hardening. Non-heat-treatable alloy sheet, wire and round drawn tubing are produced in these tempers.

Subdivisions of the -H Temper:

-H1—*Strain-hardened only. The number following this designation indicates the degree of* strain-hardening. This is the usual method of producing alloys 2S and 3S in those products furnished in the -H tempers. Material in these tempers can be made to have more uniform properties in all directions than is possible for material in the -H2 tempers. Consequently it is better suited for deep

TABLE IV Specified Mechanical Properties for Non-Heat-Treatable Aluminum Alloy Sheet and Plate

ALLOY		TEMPER		ELONGATION IN 2 INCHES—pct. minimum							
				Thickness[1]—inches (Sheet has a thickness of less than 0.250 in. Plate has a thickness of 0.250 in. or greater.)							
ASTM Designation	Commercial Designation	(Former temper designations are in parentheses.)	Ultimate Strength psi min.	0.010-0.012	0.013-0.019	0.020-0.031	0.032-0.050	0.051-0.113	0.114-0.161	0.162-0.249	0.250-3.000
A2	2S	-O	15,500[3]	15	15	20	25	30	30	30	28
		-H12[2] or -H22[2] (¼H)	14,000	..	3	4	6	8	9	9	
		-H14[2] or -H24[2] (½H)	16,000	1	2	3	4	5	6	6	
		-H16 or -H26 (¾H)	19,000	1	1	2	3	4	4		
		-H18 or -H28 (H)	22,000	1	1	2	3	4	4		
		-F[4]									
M1	3S	-O	19,000[3]	18	20	20	23	25	25	25	23
		-H12[2] or -H22[2] (¼H)	17,000		3	4	5	6	7	8	
		-H14[2] or -H24[2] (½H)	19,500	1	2	3	4	5	6	7	
		-H16 or -H26 (¾H)	24,000	1	1	2	3	4	4		
		-H18 or -H28 (H)	27,000	1	1	2	3	4	4		
		-F[4]	......								
MG1	4S	-O	29,000[3]		10	14	16	18	18	18	16
		-H32[2] (¼H)	28,000		1	3	4	5	6	6	
		-H34[2] (½H)	32,000		1	3	3	4	5	5	
		-H36 (¾H)	35,000		1	2	3	4	4		
		-H38 (H)	38,000		1	2	3	4	4		
		-F[4]	..								
GR1	52S	-O	31,000[3]	15	15	18	20	20	20	20	18
		-H32[2] (¼H)	31,000		4	5	5	7	9	9	
		-H34[2] (½H)	34,000	3	3	4	4	6	7	7	
		-H36 (¾H)	37,000	3	3	3	4	4	4		
		-H38 (H)	39,000	3	3	3	4	4	4		
		-F[4]	......								

[1] For sheet and plate under ½-in. thick, the standard ½-in. wide tension test specimen is used; for plate ½-in. or over in thickness, the standard ½-in. diam. specimen or a similar round specimen having the maximum possible dimensions proportional to those of the standard ½-in. diam. specimen is used.

[2] Mechanical test specimens are taken parallel to direction of rolling from sheet in the -H12, -H14, -H22, -H24, -H32, and -H34 tempers.

[3] Maximum. So specified to insure complete annealing.

[4] Mechanical properties not specified or guaranteed.

TABLE V Specified Mechanical Properties for Heat-Treatable Aluminum Alloy Sheet and Plate

ALLOY		TEMPER	THICKNESS[1] inches	STRENGTH—psi min.		ELONGATION IN 2 IN. pct. min.
ASTM Designation	Commercial Designation	(Former temper designations are in parentheses.)	(Sheet has thickness less than 0.250 in.; plate is 0.250 in. thick or more.)	Ultimate	Yield	
Clad CS41	Hard Clad R301 Alclad 14S	-O	0.020-0.500	30,000[2]	14,000[2]	16
		-T3 (W)	0.020-0.039	55,000	35,000[7]	14
			0.040-0.249	57,000	36,000[7]	15
		-T4 (W)	0.250-0.499	57,000	36,000[8]	15
			0.500	58,000	36,000[8]	15
		-T6 (T)	0.020-0.039	63,000	55,000	7
			0.040-0.499	64,000	57,000	8
			0.500	67,000	59,000	6
		-O	0.010-0.500	32,000[2]	14,000[2]	12

drawing and stamping operations.

-H2—*Strain-hardened and then partial annealed.* The number following this designation indicates the degree of strain-hardening remaining after the product has been partial annealed. Material in these tempers will have approximately the same ultimate strength as corresponding -H1 tempers but will have a slightly lower yield strength and a higher elongation.

-H3—*Strain-hardened and then stabilized.* The number following this designation indicates the degree of strain-hardening remaining after the product has been strain-hardened a specific amount and then stabilized. This is the usual method of producing alloys 4S, 52S, and 56S in those products furnished in the -H tempers. Unless stabilized, on standing at room temperature after strain hardening these alloys gradually decrease in yield strength as much as 25 pct and increase in elongation to double the initial value with no substantial change in ultimate strength until finally a stable condition is reached.

Subdivisions of the -H1, -H2 and -H3 Tempers:

The number following these designations indicates the final degree of strain-hardening. The hardest commercial temper is designated by the numeral 8. Material having an ultimate strength in tension midway between that of fully annealed material (0 temper) and that of the hardest commercial temper is indicated by the numeral 4. The numeral 2 designates material having an ultimate strength midway between that of -0 temper and 4 temper, and 6 temper material is midway in strength between 4 temper and 8 temper. Although 8 temper is considered to be the hardest commercial temper, a slightly harder or "super-hard" temper, designated by the numeral 9, is produced for special applications.

-W—*Solution heat-treated.* This is an unstable temper. Because of natural aging which

CG21	24S	—T3 (T)	0.010—0.020	64,000[3]	42,000[3]	12
			0.021—0.051	64,000[3]	42,000[3]	15
			0.052—0.128	64,000[3]	42,000[3]	17
			0.129—0.249	64,000[3]	42,000[3]	15
		—T4 (T)	0.250—0.500	64,000	40,000[4]	12
		—T36 (RT)	0.020—0.031	69,000	52,000	10
			0.032—0.036	69,000	52,000	11
			0.037—0.188	69,000	52,000	12
			0.189—0.500	69,000	52,000	10
Clad CG21	Pure Clad 24S Alclad 24S	—O	0.010—0.032	30,000[2]	14,000[2]	8
			0.033—0.063	30,000[2]	14,000[2]	10
			0.064—0.499	32,000[2]	14,000[2]	12
			0.500	32,000[2]	......	8
		—T3 (T)	0.010—0.020	59,000[5]	39,000[5]	12
			0.021—0.063	59,000[5]	39,000[5]	15
			0.064—0.128	62,000[5]	40,000[5]	15
			0.129—0.249	62,000[5]	40,000[5]	13
		—T4 (T)	0.250—0.499	62,000	40,000[6]	11
			0.500—	62,000	40,000[6]	8
		—T36(RT)	0.020—0.031	62,000	48,000	8
			0.032—0.040	62,000	48,000	9
			0.041—0.063	62,000	48,000	10
			0.064—0.188	66,000	50,000	10
			0.189—0.499	66,000	50,000	9
			0.500	69,000	52,000	9
		—T81	0.010—0.063	62,000	54,000	5
			0.064—0.249	65,000	56,000	5
		—T86	0.020—0.063	66,000	62,000	3
			0.064—0.249	69,000	65,000	3
GS21	R361 61S	—O	0.010—0.020	22,000[2]	12,000[2]	14
			0.021—0.128	22,000[2]	12,000[2]	16
			0.129—0.500	22,000[2]	12,000[2]	18
		—T4 (W)	0.010—0.020	30,000	16,000	14
			0.021—0.249	30,000	16,000	16
			0.250—0.500	30,000	16,000	18
		—T6 (T)	0.010—0.020	42,000	35,000	8
			0.021—0.500	42,000	35,000	10
ZG42	75S	—O	0.016—0.500	40,000[2]	21,000[2]	10
		—T6 (T)	0.016—0.039	76,000	65,000	7
			0.040—0.500	77,000	66,000	8
Clad ZG42	Alclad 75S	—O	0.016—0.500	36,000[2]	20,000[2]	10
		—T6 (T)	0.016—0.039	70,000	60,000	7
			0.040—0.499	72,000	62,000	8
			0.500	77,000	66,000	6

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[1] For sheet and plate under ½ in. thick, the standard ½-in.-wide tension test specimen is used; for plate ½ in. or over in thickness, the standard ½-in. diam. specimen or a similar round specimen having the maximum possible dimensions proportional to those of the standard ½-in. diam. specimen is used.

[2] Maximum. So specified to insure complete annealing.

[3] Heat-treated CG21 coiled sheet and CG21 sheet heat-treated by the user will be in the T4 temper, and will have a minimum ultimate strength of 62,000 psi and a minimum yield strength of 40,000 psi.

[4] CG21 plate heat-treated by the user will be in the T42 temper, and will have a minimum yield strength of 38,000 psi.

[5] Heat-treated Clad CG21 coiled sheet and Clad CG21 sheet heat-treated by the user will be in the T4 temper, and in thicknesses up through 0.063 in. will have a minimum ultimate strength of 58,000 psi and a minimum yield strength of 37,000 psi, while that 0.064 in. and thicker will have a minimum ultimate strength of 61,000 psi and a minimum yield strength of 38,000 psi.

[6] Clad CG21 plate heat-treated by the user will be in the T42 temper, and will have a minimum yield strength of 38,000 psi.

[7] Heat-treated Clad CS41 coiled sheet and Clad CS41 sheet heat-treated by the user will be in the T4 temper, and in thicknesses up through 0.039 in. will have a minimum yield strength of 32,000 psi, while that 0.040 in. and thicker will have a minimum yield strength of 34,000 psi.

[8] Clad CS41 plate heat-treated by the user will be in the T42 temper, and will have a minimum yield strength of 34,000 psi.

TABLE VI

Specified Mechanical Properties for Non-Heat-Treatable Aluminum Alloy Wire, Rod and Bar—rolled or cold-finished

ALLOY		TEMPER (Former temper designations are in parentheses.)	WIDTH In.	ULTIMATE STRENGTH psi min.	ELONGATION[1] IN 2 IN. OR 4D[2] Pct. min.
ASTM Designation	Commercial Designation				
A2	2S	-O	All	15,500[3]	25
		-H12 or -H22 (¼H)	Up through 0.374	14,000	..
		-H14 or -H24 (½H)	Up through 0.374	16,000	
		-H16 or -H26 (¾H)	Up through 0.374	19,000	
		-H18 or -H28 (H)	Up through 0.374	22,000	
		-F[4]	0.375 and up	....	
M1	3S	-O	All	19,000[3]	25
		-H12 or -H22 (¼H)	Up through 0.374	17,000	
		-H14 or -H24 (½H)	Up through 0.374	19,500	
		-H16 or -H26 (¾H)	Up through 0.374	24,000	
		-H18 or -H28 (H)	Up through 0.374	27,000	
		-F[4]	0.375 and up	....	
GR1	52S	-O	Up through 0.374	30,000[3]	25
			0.375 and up	32,000[3]	25
		-H32 (¼H)	Up through 0.374	31,000	..
		-H34 (½H)	Up through 0.374	34,000	
		-H36 (¾H)	Up through 0.374	37,000	
		-H38 (H)	Up through 0.374	39,000	
		-F[4]	0.375 and up	...	

NOTES: Wire (except flattened wire and flattened and slit wire) has a width less than 0.375 in. Rod has a diameter of 0.375 in. or greater. Bar has a width of 0.375 in. or greater.

[1] The measurement of elongation is not required for wire less than 0.125 inch in thickness.

[2] D represents specimen diameter.

[3] Maximum. So specified to insure complete annealing.

[4] Except in the annealed (O temper) condition, the temper of non-heat-treatable alloy rod and bar cannot be closely controlled and will vary according to size.

takes place spontaneously at room temperature after solution heat-treatment, this designation is specific only when the period of aging is indicated. Within four days most alloys in the -W temper spontaneously age at room temperature to the stable -T4 temper. However, refrigeration is often used to retard age-hardening so that the material can be subjected to more severe forming operations than would otherwise be possible with heat-treated material.

-T—*Treated to produce stable tempers other than -F, -O, or -H.* This designation applies to products thermally treated to produce stable tempers with or without supplementary strain-hardening. If strain hardening supplements the thermal treatment it is considered in the temper designation only where it is recognized as materially influencing the characteristics of the product. The -T is always followed by one or more digits. The numerals 2 through 10 indicate

TABLE VII

Specified Mechanical Properties for Heat-Treatable Aluminum Alloy Wire, Rod and Bar—rolled or cold-finished

ALLOY		TEMPER (Former temper designations are in parentheses.)	THICKNESS[1] In.	STRENGTH psi min.		ELONGATION[2] IN 2 IN. OR 4D[3] Pct. min.
ASTM designation	Commercial designation			Ultimate	Yield[2]	
CP21	11S	-T3	0.125-1.500	45,000	38,000	10
			1.501-2.000	42,000	33,000	14
			2.001 3.000	40,000	28,000	16
		-T8	0.125-3.250	52,000	40,000	10
CS41	14S	-O	Up through 8.000	35,000		12
		-T4(W)	Up through 8.000	55,000	32,000	16
		-T6(T)	Up through 8.000	65,000	55,000	8
CM21	17S	-O	Up through 8.000	35,000[4]		16
		-T4(T)	Up through 8.000	55,000	32,000	16
CM41	R317	-O	Up through 8.000	35,000[4]		16
		-T4(T)	Up through 1.500	55,000	32,000	16
			1.501 6.000	55,000	30,000	16
CG21	24S	-O	Up through 8.000	35,000[4]		16
		-T4(T)	Up through 8.000	62,000	40,000	14
GS21	R361 61S	-O	Up through 3.000	22,000[4]		18
		-T4(W)	Up through 3.000	30,000	16,000	18
		-T6(T)	Up through 3.000	42,000	35,000	10
ZG42	75S	-O	Up through 3.000	40,000		10
		-T6(T)	Up through 3.000	77,000	66,000	7

NOTE: Wire (except flattened wire and flattened and slit wire) has a width less than 0.375 inch. Rod has a diameter of 0.375 inch or greater. Bar has a width of 0.375 inch or greater.

[1] For material 1½ in. or less in thickness, when not tested in full-section, the tension test specimen is taken from the center of the section; for material over 1½ in. in thickness the specimen is taken midway between the center and the surface. Specimens are taken parallel to the direction of rolling.

[2] The measurement of elongation and yield strength is not required for wire less than 0.125 inch in thickness.

[3] D represents specimen diameter.

[4] Maximum. So specified to insure complete annealing.

TABLE VIII Specified Mechanical Properties for Aluminum Alloy Rolled Structural Shapes

ALLOY		TEMPER (Former temper designations are in parentheses.)	THICKNESS Inches	STRENGTH—psi min		ELONGATION IN 2 IN. Pct. min.
ASTM Designation	Commercial Designation			Ultimate	Yield	
CS41	14S	—O	All			
		—T4(W)	All			
		—T6(T)	All			
CM21	17S	—O	All	35,000[1]		16
		—T4(T)	All	55,000	32,000	16
GS21	R361 61S	—O	All	22,000[1]		18
		—T4(W)	All	30,000	16,000	18
		—T6(T)	All	42,000	35,000	10
		—T62	All	35,000	26,000	10

[1] Maximum. So specified to insure complete annealing.

types of treatment, each numeral designating a specific sequence of basic operations. When required, the numerals 11 through 19 are available for designating other types of treatment. The details of the treatment will usually be different for each alloy and may be varied for a single alloy to produce certain desired results. The treatment usually considered standard, or the first one used, is designated by -T followed by the numeral indicating that type of treatment. Variations of the conditions, resulting in different characteristics for the product, are indicated by adding one or more digits to the treatment designation. No attempt is made to have these indicate any specific set of conditions. Just as the actual temperatures and times required to produce 53S-T6 are different from those required for 14S-T6, so are those used for 53S-T61 different from those required for 14S-T61. The numeral 1 following the 6 merely signifiies that the product has properties different from those obtained by the standard -T6 treatment for

TABLE IX Specified Mechanical Properties for Aluminum Alloy Extruded Rod, Bar, Shapes, Tubing and Pipe

ALLOY		TEMPER (Former temper designations are in parentheses.)	THICKNESS[1] In.	AREA sq. in.	STRENGTH—psi min.		ELONGATION[2] IN 2 IN. OR 4D[3] Pct. min.
ASTM Designation	Commercial Designation				Ultimate	Yield	
M1	3S	—O	All	All	19,000[4]	......	25
		—F	All	All	......[5]	......[5]	..[5]
CS41	14S	—O	All	All	30,000[4]	18,000[4]	12
		—T4(W)	All	All	50,000	35,000[6]	12
		—T6(T)	0.125—0.499	All	60,000	53,000	7
			0.500—0.749	All	64,000[7]	58,000[7]	7
			0.750 and up	Up through 25	68,000[7]	60,000[7]	7
				Over 25 through 32	68,000[7]	58,000[7]	6
CM21	17S	—O	All	All	30,000[4]	18,000[4]	12
		—T4(T)	All	All	50,000	35,000[6]	12
CG21	24S	—O	All	All	35,000[4]	19,000[4]	12
		—T4(T)	0.050—0.249	All	57,000	42,000[8]	12
			0.250—0.749	All	60,000[8]	44,000[8]	12
			0.750—1.499	All	65,000[8]	46,000[8]	10
			1.500 and up	Up through 25	70,000[8]	52,000[8]	10
				Over 25 through 32	68,000[8]	48,000[8]	8
GS22	R353 53S	—O	All	All	19,000[4]	......	18
		—F	All	All	17,000	10,000	10
		—T4(W)	All	All	25,000	14,000	16
		—T5	All	All	22,000	16,000	10
		—T6(T)	All	All	32,000	25,000	10
GS21	R361 61S	—O	All	All	22,000[4]	16,000[4]	16
		—T4(W)	All	All	26,000	16,000	16
		—T6(T)	All	All	38,000	35,000	10
		—T62	All	All	35,000	26,000	10
GS1	63S	—O	All	All	19,000[4]		18
		—F	Up through 0.375	All	17,000	10,000	10
		—T5	Up through 0.500	All	22,000	16,000	8
		—T6(T)	Up through 0.124	All	32,000	25,000	8
			0.125—0.500	All	32,000	25,000	10
ZG42	75S	—O	All	All	40,000[4]	24,000[4]	10
		—T6(T)	Up through 0.249	All	78,000	70,000	7
			0.250—2.999	All	80,000	72,000	7
			3.000—4.499	Up through 20	80,000	70,000	7
				Over 20 through 32	78,000	70,000	6
			4.500—5.000	Up through 32	78,000	68,000	6

[1] The thickness of the section from which the tension test specimen is taken determines the applicable mechanical properties. For material 1½ in. or less in thickness, when not tested in full-section, the tension test specimen is taken from the center of the section; for material over 1½ in. in thickness, the specimen is taken midway between the center and the surface. Specimens are taken parallel to the direction of extrusion.

[2] For material of such thickness that a standard test specimen cannot be taken, or for material thinner than 0.062 in., the test for elongation is not required.

[3] D represents specimen diameter.

[4] Maximum. So specified to insure complete annealing.

[5] Mechanical properties not specified or guaranteed.

[6] CS41 and CM21 extruded products heat-treated by the user will be in the T42 temper, and will have a minimum yield strength of 29,000 psi.

[7] CS41 extruded products heat-treated and aged by the user will be in the T62 temper, and will have a minimum ultimate strength of 60,000 psi and a minimum yield strength of 53,000 psi.

[8] CG21 extruded products heat-treated by the user will be in the T42 temper, and will have a minimum ultimate strength of 57,000 psi and a minimum yield strength of 38,000 psi.

TABLE X Specified Mechanical Properties for Aluminum Alloy Drawn Tubing and Pipe.

ALLOY		TEMPER (Former temper designations are in parentheses.)	WALL THICKNESS In.	STRENGTH—psi min.		ELONGATION IN 2 IN. or 4D[1] pct. min.	
ASTM Designation	Commercial Designation			Ultimate	Yield	Full-Section Specimen[2]	Cut-out Specimen[3]
M1	3S	-O	All	19,000[4]			
		-H12 or -H22 ($\frac{1}{4}$H)	All	17,000			
		-H14 or -H24 ($\frac{1}{2}$H)	All	19,500			
		-H16 or -H26 ($\frac{3}{4}$H)	All	24,000			
		-H18 or -H28 (H)	All	27,000			
		-F[5]	All				
MG1	4S	-O	All	29,000			
		-H32 ($\frac{1}{4}$H)	All	27,000			
		-H34 ($\frac{1}{2}$H)	All	30,000			
		-H36 ($\frac{3}{4}$H)	All	34,000			
		-H38 (H)	All	36,000			
		-F[5]	All				
CG21	24S	-O	All	35,000[4]	15,000[4]		
		-T3 (T)	0.018—0.024	64,000	42,000[6]	10	
			0.025—0.049	64,000	42,000[6]	12	10
			0.050 -0.259	64,000	42,000[6]	14	10
			0.260—0.500	64,000	42,000[6]	16	12
GR1	52S	-O	All	31,000[4]			
		-H32 ($\frac{1}{4}$H)	All	31,000			
		-H34 ($\frac{1}{2}$H)	All	34,000			
		-H36 ($\frac{3}{4}$H)	All	37,000			
		-H38 (H)	All	39,000			
		-F[5]	All				
GS21	R361 61S	-O	All	22,000[4]	14,000[4]	15	15
		-T4 (W)	0.025 0.049	30,000	16,000	16	14
			0.050 -0.259	30,000	16,000	18	16
			0.260—0.500	30,000	16,000	20	18
		-T6 (T)	0.025—0.049	42,000	35,000	10	8
			0.050- 0.259	42,000	35,000	12	10
			0.260—0.500	42,000	35,000	14	12

[1] D represents specimen diameter.

[2] Round tubing and pipe 2 in. or less in outside diameter and square tubing 1$\frac{1}{2}$ in. or less on a side is tested in full-section unless the limitations of the testing machine preclude the use of such a specimen.

[3] For round tubing and pipe over 2 in. diameter, for square tubing over 1$\frac{1}{2}$ in. on a side, for all sizes of tubing other than round and square, or in those cases when a full-section specimen cannot be used, a cut-out specimen is used.

[4] Maximum. So specified to insure complete annealing.

[5] Produced only as non-heat-treatable alloy tubing other than round, for which mechanical properties are not specified except when in the annealed (O temper) condition.

[6] CG21 drawn tubing and pipe heat-treated by the user will be in the T4 temper, and will have a minimum yield strength of 40,000 psi.

that alloy.

Subdivisions of the -T Temper:

-T2—*Annealed* (cast products only). This designation is applied to castings only, to indicate a type of annealing operation used to improve ductility and increase dimensional stability (142-T21).

-T3—*Solution heat-treated and then cold-worked.* This designation applies to those products where cold-work is performed for the primary purpose of improving the strength (24S-RT becomes 24S-T36), and also applies to those products in which the effect of cold-work—such as flattening or straightening—is recognized in applicable specifications (24S-T flat sheet heat-treated by the producer becomes 24S-T3, but when heat-treated by the user this designation is not applicable).

-T4—*Solution heat-treated and naturally aged to a substantially stable condition.* This designation applies when the product is not cold-worked after heat treatment (24S-T sheet heat-treated by the user becomes 24S-T4), and also when applicable specifications do not recognize the effect of cold-work in flattening and straightening operations (R361-W flat sheet heat-treated by the producer becomes R361-T4).

-T5—*Artificially aged only.* This designation applies to products which are artificially aged without prior solution heat-treatment. The artificial aging of these products improves mechanical properties (63S-75 extrusions), and dimensional stability (A132-T551 cast pistons).

T6—*Solution heat-treated and then artificially aged.* This designation applies to products which are not cold-worked after solution heat treatment and in which the effect, if any, of flattening or straightening is not recognized in applicable specifications. (Whether flattened or not, R361-T becomes R361-T6, and 14S-T becomes 14S-T6).

-T7—*Solution heat-treated and then stabilized.* This designation applies to products in which the temperature and time conditions for stabilizing are such that the alloy is carried beyond the point of maximum hardness, providing control of growth and/or residual stress (355-T71).

-T8—*Solution heat-treated, cold-worked, and then artificially aged.* This designation applies when the cold-working is done for the purpose of improving strength (Pure Clad 24S-T86 flat sheet), and also when the cold-working effect of flattening or straightening is recognized in applicable specifications (Pure Clad 24S-T81 flat sheet).

-T9—*Solution heat-treated, artificially aged, and then cold-worked.* This designation applies when the cold-working is done for the purpose of improving strength (R331-T91) nail wire).

-T10—*Artificially aged and then cold-worked.* This designation applies to products which are artificially aged without prior solution heat-treatment and then cold-worked for the purpose of improving strength.

New Developments in Gearing Studied at AGMA Meeting

ENGINEERING and manufacturing developments and problems in the production of industrial gears and gearing were discussed by gear manufacturers at the 32nd annual convention of the American Gear Manufacturers Assn., at Hot Springs, Va., June 7 to 9. At the same meeting new officers of the association for the coming year were elected.

The inauguration of the 70 group air program, along with allied programs of rearmament, will likely cause an extremely heavy demand for gears, members of AGMA believe. While this fact was no more than casually mentioned at the meeting, it was definitely in the minds of those who planned and participated in the program. Gearing for such items as aircraft engines, range finders for guns, and the like are somewhat of a specialized nature, as are gears required in ship propulsion machinery. However, many of the illustrations used by the speakers and those entering into the discussions were based on such specialized types of gearing.

Formal papers presented at the meeting included: "Some Factors Influencing the Quality of Ground Gears and Worms," by L. P. Tarasov, research engineer of Norton Co., Worcester, Mass.; "Statistics in the Gearing Industry," by D. T. MacCartney, AGMA statistician; and "Problem of Noise in Marine Propulsion Gears," by George Wohlberg, superintendent of Wave Mechanics Laboratory, US Naval Engineering Experiment Station, Annapolis.

Walter L. Schneider, vice-president, Falk Corp., Milwaukee, was elected president of AGMA. Succeeding Mr. Schneider as vice-president of the association is F. W. Walker, executive vice-president of the Philadelphia Gear Works, Inc., Philadelphia. Elected treasurer was Roger B. Salinger, president of Massachusetts

Walter L: Schneider, President

F.W. Walker, Vice-President

Gear & Tool Co., Woburn, Mass.

Four members elected to the executive committee were: Paul A. Manger, chief engineer, Buffalo Div., Farrel-Birmingham Co., Buffalo; Louis B. Bond, vice-president and general manager, Christiana Machine Co., a subsidiary of the Charles Bond Co., Philadelphia; S. L. Crawshaw, manager of engineering and sales, Western Gear Works, Seattle, Wash., and its subsidiary Pacific Gear & Tool Works, San Francisco; and John H. Flagg, president, Watson Flagg Machine Co., Inc., Paterson, N. J.

The Connell Award, established by the Falk Corp. in commemoration of the late Edward P. Connell, was made to Louis D. Martin, gear engineer of Eastman Kodak Co. The award was made to Mr. Martin "for his immeasurable contributions to the gearing industry's knowledge and literature, particularly in the fine pitch gearing field."

In the paper on gear grinding, presented by Dr. Tarasov, various types of grinding defects in gears, their detection, causes of such injuries, grinding factors, and methods of avoiding trouble were outlined, based on studies made on carburized and alloy gear steels. Cracks occurring in ground gears are usually visible, but frequently their presence has to be detected by either Magnaflux examination or etching, the paper explained. Burns, on the other hand, are practically always evident, unless the surface is reground to remove the discoloration. A series of screen projections showed various grinding defects in gears and surfaces and indicated that crack patterns are at right angles to the direction of grind.

Cracks are caused by a variety of factors. The grinding may be too slow, the steel may be too brittle, or the heat treatment may have been wrong. Burns, however, look like temper colors; frequently cause metallurgical changes in the part and are usually caused by excessive wheel speeds or work feeds.

The causes of injuries to ground surfaces are several in alloy and carburized parts. Sensitive steels that are brittle with respect to grinding, carbide networks on the surfaces of carburized steels, single-tempered high speed of high carbon-high chromium steels, decarburization of specific areas, steel hardness, and specifications that limit hardness only in one direction are frequently the cause of grinding troubles. As to grinding factors themselves, the sharpness of the wheel is of primary importance, with the dressing of the wheel probably second. Grinding fluids, wheel selection and wheel and grinding speeds are likewise important factors.

A rule of thumb suggestion in locating the source of a grinding injury was suggested in the paper. If the steel is cracked but not burned, the steel chemistry and its heat treatment should be checked. If the steel shows any signs of burn, it is suggested that the grinding technique be examined.

Questions from the floor brought out some of the practical aspects of grinding problems. It was pointed out that in one shop a grinding operation was consistently resulting in a burned part. However, when the table feed was increased without any change in wheel speed, the burn disappeared. The increase in the table speed, in effect, amounted to a reduction in the wheel speed, it was evident that the heat was spread over a greater area and burn was eliminated. Problems in grinding nitrided steels were mentioned, but it appears there has been little investigative work done in this field. It was asked if dry grinding had any real place in production work, and the speaker claimed many steels can be ground dry. He pointed out that high speed steels and high carbon-high vanadium steels dry grind better than with a fluid.

An innovation in AGMA programming was the engineering forum, the panel of which consisted of A. H. Candee, Gleason Works; Louis D. Martin, Eastman Kodak Co., F. Richardz, Westinghouse Electric Corp., C. R. Staub, Michigan Tool Co., P. A. Manger, Farrel-Birmingham Co.; R. E. Rawling, Rawling Gear Co., and S. L. Crawshaw, Western Gear Works. The forum discussions were based on prepared questions on gearing that were formally discussed by members of the forum and then presented to the membership for further discussion. Factors other than actual cutting of the gear that effect quality were discussed by Mr. Staub. Steel within specifications, uniform forging practice and normalizing practice, good dies and similar factors were recommended. Mr. Richardz pointed up some of the mechanical factors influencing gear quality, such as worn forging dies, improperly strain-relieved castings, and improper lapping methods.

The question of backlash in gears and factors determining it were discussed by Louis D. Martin. There was considerable attention given this subject, as it applies to industrial gearing and from the standpoint of increased importance in aircraft gearing. Mr. Martin pointed out some of the factors that determined backlash, and indicated that all composite errors of a gear must be eliminated to eliminate backlash. Mr. Richardz took up the discussion of backlash from the standpoints of center distances of gears and temperature. It was pointed out that a certain amount of backlash is necessary, and, in heavy industrial applications over long periods of time, backlash unless excessive is not of primary importance because of normal gear wear. Where backlash must be held to extreme minimums is in precision gearing such as in aircraft engine work.

Among other points covered by the forum were lubricants, upon which new proposed standards will be presented soon by AGMA; techniques of plotting involute curves; practical methods for small gear shops to establish and maintain order records; and differences between AGMA practices for slow speed and high speed helical and herringbone gearing.

The paper presented by D. T. MacCartney dealt with the necessity for the gear industry to accumulate and maintain accurate industry-wide statistics. Efforts to determine a method for arriving at accurate machine-hour-burden-rates and to develop representative rates for common gear making machines are being made by AGMA. Because management needs such information in planning future courses in business, AGMA is endeavoring to make it available on the gearing industry to members.

Computation of the AGMA gearing index, long a significant index to statisticians of business trends, was revised in January. The index is now a controlled index based upon the comparative showing of 21 representative companies. This procedure, according to Mr. MacCartney, eliminates the distorting factor caused by the varying number of participating companies from month to month.

Louis D. Martin, Recipient of Connell Award

It is planned that in the near future this index will be further adjusted to take into consideration price differentials in order to eliminate fluctuations caused by the unstabilized monetary system. There will be no inflationary factors in the index. It is expected this new type index will be ready by the middle of the year.

Problems of "Noise in Marine Propulsion Gearing," a paper by George Wohlberg, discussed the need for operational quietness, especially in wartime. Underwater ship and submarine detection devices are mainly the sonar listening type devices, and there are continual efforts being made to further reduce gearing and machinery noises. He described the generation of noise in gears, some of the work being done to reduce gear noise, some basic noise test instrumentation, methods by which sounds are measured, noise testing of gears, and the new acoustical laboratory facilities at the US Naval Engineering experiment Station at Annapolis. This laboratory is designed to provide a favorable acoustic environment for noise investigations on both main-propulsion and auxiliary machinery of ships.

Machines under test at the laboratory can be isolated acoustically from connected machinery at the lab. This is done by placing the machinery under test and that connected to it in spearate rooms whose boundaries provide a high sound transmission loss. Shafting penetrates the boundaries of the rooms though soundproof seals. Ground borne noise and vibrations are suppressed by isolation of massive machinery test beds from the surrounding buildings and the soil by isolation trenches. Ambient air-borne noise is attenuated by about 45 decibels by essentially monolithic heavy concrete walls. Reverberation and stand-wave effects are almost eliminated by anechoic sound-absorbing linings in the test rooms. Piping systems are isolated from machines they serve by nonmetallic connectros where practical.

Hardness Testing of Soft Metals

° ° °

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° ° °

Including in the category of "soft" metals all metals possessing a hardness below 400 Diamond Pyramid Hardness, the author indicates the reasons why hardness testing of soft metals presents problems not ordinarily encountered in the testing of heat-treated steels. Critically evaluating the applicability of various well-known and accepted types of apparatus for testing metals of low hardness, the author also discusses the influence of metallurgical characteristics on the reliability of test results. Difficulties associated with the conversion of hardness data from one scale to another are also covered in this article.

THE performance of identation hardness tests on metallic products is such a well-accepted routine and so much has been written on the subject that it may appear superfluous at first glance to add another contribution to the many already extant. Most of such contributions, however, have been written on the testing of steels or have been descriptions of the many tests employed for measuring hardness.

The several factors influencing the accuracy of results from identation hardness tests on soft metals have not been adequately emphasized and a satisfactory common hardness conversion table has not as yet been offered to the industry. Some of the difficulties surrounding the development of a single hardness conversion table for all metals and which would include most hardness tests will be described in this article. The writer includes in the category of soft metals all metals, both ferrous or nonferrous, possessing a hardness below 400 DPH (Diamond Pyramid Hardness).

There are several reasons why hardness tests of soft metals present problems not ordinarily encountered in the testing of heat-treated steels.

(1) Several tests which measure hardness by a change in the depth of penetration of a ball indentor are increasingly sensitive to small errors as the identations become larger. The influence of errors in these testing instruments as

well as deviations of testing procedure, therefore, becomes proportionately greater the lower the hardness of the metal or alloy tested.

(2) The wide variety of metals that are tested in the low hardness range requires a versatility not usually obtained in most testing apparatus. Metals above 400 DPH in hardness consist mainly of steels and a few high temperature alloys, whereas all metals with all their individual characteristics are found in some state in the low hardness range.

(3) Practically all metals in their soft state are susceptible to work or strain hardening when undergoing the plastic deformation inherently produced by indentation hardness tests. For this reason the actual or intrinsic hardness of a work-hardenable metal is not measured by any of the existing tests.

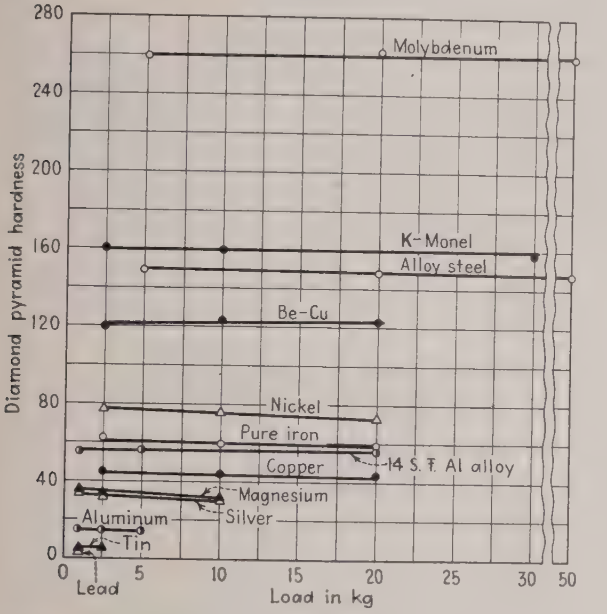

FIG. 1 - Effect of testing load on Diamond Pyramid Hardness for annealed metals below DPH of 400.

(4) The surface work hardening produced during the preparation of most ferrous and nonferrous metals and their alloys will influence the results of hardness tests. Surfaces of hardened high-temperature alloys and hardened or tempered steels are not susceptible to work hardening.

Before entering into a discussion of how the above factors influence the accuracy of hardness tests and the reliability of hardness conversions between one test and another, mention should be made of the applicability of the better known and accepted types of apparatus for testing metals of low hardness.

Hardness evaluations of soft metals have been hampered by the mechanical limitations of many of the testing machines employed for measuring the hardness. These limitations consist mainly of excessive immersion of the indentors, inadequate scale range, or both. By changing indentors and loads it is possible to extend the range of many of the hardness testers, but usually with the complication of adding new hardness scales.

The convenience of the diamond (Vickers) pyramid test for the testing of metals of low hardness is exemplified by the single scale of hardness values found for all materials of all hardnesses from that of lead to that of tungsten carbides. The same indentor and scale is used while the range of the instrument is extended by changing the load. The negligible influence of the change in load on the hardness scale when complicating factors such as surface hardened layers of metal are not present is illustrated in fig. 1; the slight increase in hardness values at the very light loads is attributed to a slight work-hardened surface produced on the specimens in spite of the great care taken in preparation. An additional advantage of the diamond pyramid tester is that it can be calibrated directly from standards of lengths and weights. In commercial use the test is handicapped by its slowness.

The Rockwell C test procedure can be used on metals with hardness values as low as 20 Rc (245 DPH). For lower hardness values the Rockwell C scale is not recommended by the manufacturer since part of the indentation will be made by an uncalibrated portion of the diamond cone indentor. For metals of lower hardness values the Rockwell B, E, and 30T scales, employing ball indentors and light loads, are recommended, but these tests are limited by the complete immersion of the ball indentors into the very soft metals such as silver, aluminum, tin and lead. Before these depths of immersion are reached, however, the tests are limited by the shortness of the scale range. As a result the hardness of many metals and alloys cannot be measured by any of the Rockwell tests.

The Brinell test employing the 10 mm ball and either 3000 or 500 kg loads is commonly used in many industries and laboratories.

The 3000-kg load is not applicable to very soft metals as under this load the ball may be indented to a depth greater than its radius. This limit of indentation occurs at a hardness of 19.2 Bhn. However, a greater practical limitation is that with hardness values lower than 100 Bhn the range of the standard Brinell microscope, 6 mm, is exceeded.

To extend the Brinell test over the very soft metal range, a 500-kg load is recommended with the 10 mm ball. With this load the hardness number obtained with a given metal is somewhat lower than that obtained with the 3000-kg load. Under the 500-kg load, hardness values down to 16 Bhn can be measured without exceeding the range of the Brinell microscope. Below 3.2 Bhn the ball is again immersed beyond its radius.

Other types of hardness tests are sometimes employed, but the described tests or their modifications comprise the great majority of laboratory or commercial testers commonly in use.

Hardness testers, that employ balls for indentors and measure hardness by the depth of penetration of the indentors, become increasingly sensitive to small changes in hardness of the material as the material becomes softer and the penetrations approach depths near the radius of the indentors. Under these conditions the ratio of the load-supporting or indented surfaces to the depth of penetration becomes less with the decrease in hardness so that small differences in hardness produce very large changes in depth (a greater dissimilarity in geometrical dimensions) with corresponding large changes in hardness readings.

The influence of factors which tend to cause small errors in hardness readings at the high hardness range, therefore, becomes increasingly magnified at the low hardness range. An error of 10 DPH in the hardness range of 160 to 170 DPH corresponds to an error of 3 R_B hardness numbers at an R_B value of 80, whereas at the range of 75 to 80 DPH, a 5 DPH error will correspond to an R_B error of 8 at an R_B value of 18.5

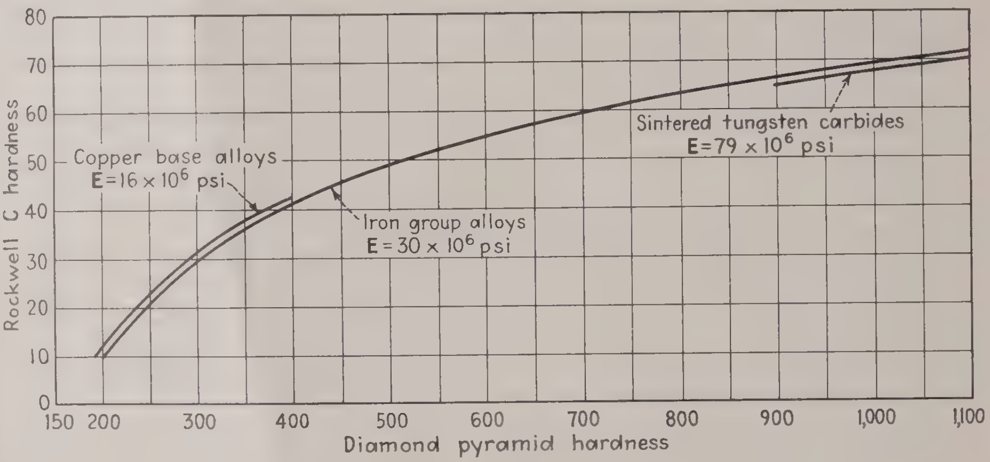

FIG. 2 - Effect of difference in elastic moduli on DPH to Rc conversion relationship.

Effect of Variety of Metals Tested

Practically all metals and most of their alloys fall within the category of soft metals in some stage of their preparation and application. These include: Annealed, normalized, cast or highly tempered steels; annealed, precipitation-hardened or work-hardened ferrous and nonferrous metals and alloys; pure metals; cast irons; etc. Each metal reacts differently, though slightly, to being indented by the various hardness tests, causing a corresponding change in their hardness rating.

Differences in the elastic modulus of metals tested have been found to cause discrepancies in the conversion relationships between certain hardness scales because of the differences in the amount of elastic springback of the respective metals under the indentors when the loads are removed.

Because of the differences in the mode of measurements, the conversions between the Rockwell C scale and the diamond pyramid hardness scale when testing metals of dissimilar elastic moduli[1] are particularly affected. The Rockwell test measures hardness in terms of depth of penetration, which is influenced measurably by the elasticity or recovery of the material when the load is removed, while the diamond pyramid values are found by measuring a lateral surface dimension of the indentation, a dimension influenced to a lesser extent by elasticity. The greater degree of elastic deformation suffered under the 150-kg load of the Rockwell C tests accentuates the influence of recovery when the load is removed.

The effect of the differences in elastic modulus on hardness conversions is illustrated in fig. 2 by the three conversion curves, one for ferrous alloys, one for copper base alloys, and one for tungsten carbides. The differential effect of the strain hardening of copper and of steel on the hardness testers may also be influential in causing the discrepancy in the Rc-DPH conversion between the ferrous metals and copper though well-worked copper specimens were employed. This factor is nonexistent between the hardened steel and tungsten carbide conversion relationships, however.

A second effect of the wide variety of metals tested arises from their differences in work-hardening capacity.

Most tests for hardness produce a deformation under the indentor during the course of the test from which the conclusion must be reached that hardness numbers so obtained do not represent the absolute or intrinsic hardness of the material, but the intrinsic hardness plus an added increment of hardness resulting from the existence of strain hardenability. This is true provided the material possesses a capacity of being strain or work hardened. Although some metals, such as hardened steels, are not significantly strain hardenable, the majority are, particularly in their softened or annealed state. Indentation hardness test results of soft metals, therefore, are dependent on the absolute hardness of metals, the work-hardening capacity of the metal, the type of test employed (pyramid, cone, or ball) and their methods of measurements and on the magnitudes of the deformations.

Meyer[2], O'Neill[3], Hoyt[4], and Heyer[5] have all shown the effect of strain hardening on the results of Brinell tests. Meyers has derived a hardness equation which takes into consideration this effect:

$$M = \frac{4L}{\pi\, d^2} \text{ or, } \frac{4a}{\pi}\, d^{n-2}$$

where $L = ad^n$, M = Meyer hardness in kg per sq mm of projected area, L = load in kg on a 10 mm ball, a = pretest hardness, n = coefficient representing strain hardenability, and d = diameter of indentation in millimeters.

TABLE I

Work-Hardening Capacity of Metals[5]

Alloy	Treatment	n
Armco (A)	Rolled	2.25
Armco (B)	Annealed	2.39
Mild steel (A)	Cold drawn	2.14
Mild steel (B)	Spheroidized	2.14
Mild steel (C)	Quenched	2.17
Mild steel (D)	Annealed	2.26
SAE No. 2330	Rolled	2.20
20 pct. Cr (A)	Rolled	2.17
20 pct. Cr (B)	Annealed	2.26
18-8 (A)	Rolled	2.34
18-8 (B)	Annealed	2.37
Monel (A)	Cold drawn	2.16
Monel (B)	Annealed	2.26
Herculoy (A)	Cold drawn	2.15
Herculoy (B)	Annealed	2.44
Brass (A)	Cold finished	2.12
Brass (B)	Annealed	2.42
Alcoa 51S (A)	Cold finished	2.10
Alcoa 51S (B)	Quenched	2.16
Alcoa 51S (C)	Precipitated	2.13
Alcoa 51S (D)	Annealed	2.20
Alcoa 2S (A)	Cold finished	2.01
Alcoa 2S (B)	Annealed at 600° F.	2.23
Alcoa 2S (C)	Annealed at 1100° F.	2.20
Dowmetal (A)	Extruded	2.44
Dowmetal (B)	Heat treated	2.49

TABLE II

Depth of Metal to be Removed

Polishing Method	Cu (42 DPH)	Brass (157 DPH)	24S (120 DPH)	Tool Steel (340 DPH)
Coarse grinding	5.0	1.0	1.0	0.2
Fine grinding	2.0	0.5	0.5	0.1
Metallographic papers	1.6	0.2	0.2	0.006
No. 1 Wax wheel	1.0	0.1	0.1	...

The influence of changes in the work-hardening capacity on Brinell hardness values is shown in fig. 3. Values of *n*, which indicate the work-hardening capacity of various metals and are obtained from the data of Heyer, are given in table I. These values of *n* provide a clue to the degree of care required in preparation of metal surfaces for hardness tests. Those metals having the highest *n* values require the most care in preparation.

Surface Hardening Effects

In another way the work-hardening capacity of the metals tested will influence the reliability of hardness test results and subsequent conversions to other hardness scales. This results from the differential surface hardening produced by various methods of preparation and the differences in depths of penetration of indentors of various shapes under a range of loads. Where the depths of penetration of the tests compared are widely different such as between a Vickers diamond pyramid test with a light load and Brinell or Rockwell C tests with their heavier loads, the hardness being measured by either test is not a representative hardness of the specimen as a whole but merely that of the layer penetrated. The test which penetrates the least will yield the highest hardness values.

The presence of a surface hardened layer of metal can be indicated by (1) a large scatter of test values and (2) by an increase in hardness values with a reduction in the testing load employed, i.e., a decrease in the amount of penetration.

Grinding causes some superficial hardening of metallic surfaces regardless of the care taken. However, the degree of surface hardening is less than that produced by machining or filing the surfaces. With proper grinding techniques the surface hardening can be greatly minimized particularly by using clean unclogged wheels of low particle bonding strength. Filing metal surfaces produces a hardening effect similar to that caused by heavy grinding. Machining causes a higher surface hardening and a deeper penetration of hardening than either grinding or filing. An increase of as high as 100 DPH in surface hardness can be produced on machined surfaces of nickel and nickel-copper alloys.

Where hardness tests are used that have extremely small depths of penetration such as the Tukon test, even the small depth of surface hardening produced by normal metallographic polishing will produce errors in conversion between the Tukon test results and Vickers hardness test results, fig. 4.

From the work of Hull[6] the following recommendations for preparation of metal surfaces for hardness tests are given:

At each stage of polishing, after the scratches from the previous step have been removed, polishing must be continued to remove the underlying distorted metal. Table II lists approximate depths of work hardening due to various steps in polishing—for several materials. The necessary

TABLE III

Minimum Thickness in Inches of Stock Required for Accurate Readings by Tests Noted. Values Given Are Ten Times Calculated Depth of Impressions

Hardness of Stock	Diamond Pyramid Hardness Tests		Rockwell Test				Brinell Test	
DPH	5 Kg	30 Kg	Rc Cone 150 Kg	Rb 1/16 in. Ball 100 Kg	Re 1/8 in. Ball 100 Kg	R30t 1/16 in. Ball 30 Kg	3000 Kg	500 Kg
400	0.0086	0.0210	0.050	...	.	0.0046	0.102	
350	0.0092	0.0224	0.055		....	0.0055	0.114	0.025
300	0.099	0.0242	0.059	0.020	...	0.0066	0.134	0.028
250	0.0108	0.0266	0.066	0.025		0.0079	0.162	0.032
200	0.0121	0.0297	0.072	0.032	0.0185	0.0101	0.197	0.037
150	0.0140	0.0343	...	0.045	0.0242	0.0141	0.275	0.050
100	0.0171	0.0419	...	0.071	0.0370	0.0213	0.400	0.074
75	0.0198	0.0485	...	0.108	0.0506	0.0288	0.500	0.100
50	0.0242	.....	...	....	0.0836	0.0440		0.130
25	0.0343	.....	....	....	...	...		0.248
10	0.0542	.....	....	....	.....	.....	.	

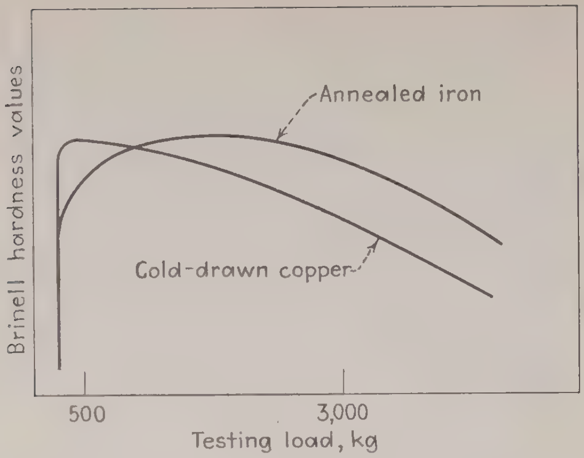

FIG. 3 - Variation of Brinell hardness values with testing load occurring as a result of work hardening and geometrical unsimilarity of indentations.[3]

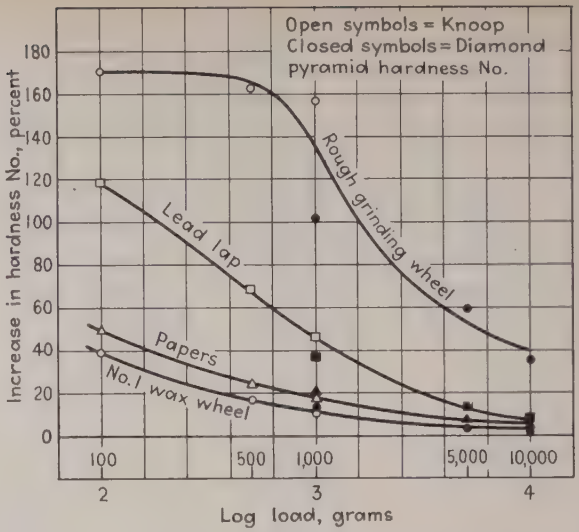

FIG. 4 - Surface hardening of annealed O.F.H.C. copper by different methods of polishing. Initial hardness (no cold work) 42 DPH (10 kg load).

amount of polishing can be estimated from this table. For example, 5 mils of copper should be removed with a fine grinding wheel to get below the deformed region produced by coarse grinding.

However, such preparations as described here are only possible for those specimens which can be easily handled, and usually are practical only in a very small minority of cases. For large parts where it is impossible to employ such preparation, it should be understood that any attempt to convert hardness scale values found by one test on easily work-hardenable metals to that of another scale is susceptible to error except where the depth of penetration and the mode of test are similar.

TABLE IV

Hardness Conversion for Metals 400 DPH and Under

Diamond Pyramid Hardness 5-50 Kg Load	Rockwell Hardness				Brinell Hardness, 10 mm Ball		Diamond Pyramid Hardness 5-50 Kg Load	Rockwell Hardness				Brinell Hardness, 10 mm Ball	
	B Scale, 100 Kg on 1/16 in. Ball ①	C Scale, 150 Kg on Diamond Brale ②	E Scale, 100 Kg on ⅛ in. Ball ①	Superficial 30 Kg on 1/16 in. Ball ③	3000 Kg Load ④	500 Kg Load ⑤		B Scale, 100 Kg on 1/16 in. Ball ①	C Scale, 150 Kg on Diamond Brale ②	E Scale, 100 Kg on ⅛ in. Ball ①	Superficial 30 Kg on 1/16 in. Ball ③	3000 Kg Load ④	500 Kg Load ⑤
DPH	R_b	R_c	R_e	30T	Bhn	Bhn	DPH	R_b	R_c	R_e	30T	Bhn	Bhn
400	...	41	...	89.5	380	...	150	77.5	...	102.5	68	138	131
390	...	40	...	89.2	370	...	145	75.5	...	101.5	67	133	127
380	...	39	...	88.8	361	...	140	73.5	...	100.5	66	128	122
370	...	38	...	88.5	351	...	135	71.5	...	99.5	64.5	123	118
360	...	36.5	...	88	342	283	130	69	...	98	63	118	114
350	...	35.5	...	87.5	333	277	125	66	...	97	61.5	113	109
340	...	34.5	...	87	323	271	120	63	...	95.5	60	109	105
330	...	33	...	86.5	313	264	115	59.5	...	94	58	104	100
320	...	32	...	86	304	258	110	56	...	92	56	99	96
310	108	30.5	...	85.5	294	252	105	52	...	90	54	94	92
300	107	29	...	85	285	245	100	48	...	88	51.5	89	87
290	106	27.5	...	84.5	275	239	95	42.5	...	85.5	49	84	83
280	105	26	...	84	266	232	90	38	...	83	46	79	78
270	103.5	24.5	...	83	256	225	85	32.5	...	80	42.5	74	74
260	102.5	23	...	82.5	247	218	80	26	...	76.5	39	69	70
250	101	21	...	82	237	211	75	18.5	...	72.5	34.5	64	65
240	99.5	19	...	81	228	204	70	10	...	68	30	59	61
230	98	17	..	80	219	197	65	1.5	...	62.5	24	...	56
220	96.5	14.5	111	79	209	188	60	...	...	56	18	...	52
210	94	12	110	78	199	180	55	...	...	47	10.5	...	48
200	92.5	9.5	109	77	190	172	50	...	...	35	...	...	43
195	91	...	108.5	76	184	168	45	...	...	...	...	...	39
190	90	...	108	75	178	164	40	...	...	...	...	...	34
185	89	...	107.5	74.5	173	160	35	...	...	...	...	...	30
180	87.5	...	107	74	168	156	30	...	...	...	...	...	26
175	86	...	106.5	73	163	152	25	...	...	...	...	...	21
170	84.5	...	105.5	72	158	148	20	...	...	...	...	...	17
165	83	...	105	71.5	153	144	15	...	...	...	...	...	13
160	81.5	...	104	70.5	148	140	10	...	...	...	...	...	9
155	79.5	...	103	69.5	143	136	5	...	...	...	...	...	5

① Variation = ± 10 DPH for a wide variety of ferrous and nonferrous metals and alloys independent of hardening method or heat treatment.

② Variation = ± 10 DPH only for steels and other alloys having about the same elastic modulus, independent of treatment. For copper base alloys add 2.5 to R_c value whether obtained by conversion or observed for conversion.

③ Variation = ± 10 DPH.

④ Variation = ± 10 DPH.

⑤ Variation = ± 15 DPH.

When variations exceed the above, the average of several readings should be taken before considering the material unsatisfactory.

The variation of conversion relations depends on the condition of the hardness testing apparatus, care in making the tests and on the uniformity of the material tested.

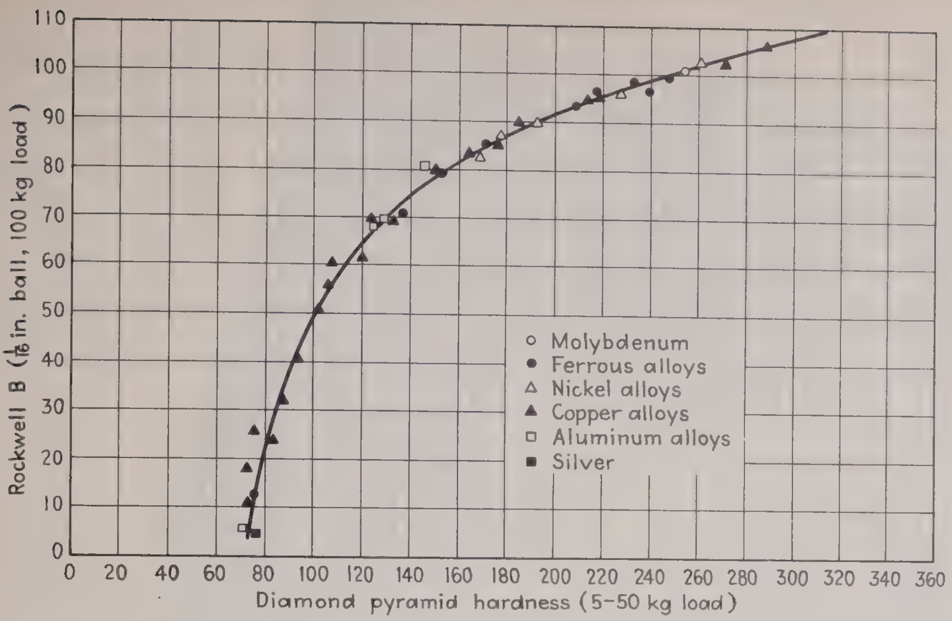

FIG. 5 - DPH-Rb conversion relationship.

Minimum Thickness of Stock

The minimum thickness values of soft materials to be safety tested by the common hardness tests are tabulated in table III. The thicknesses are calculated on the assumption that they should be 10 times the depth of impression produced by the testers. These values have been shown by O'Neill and other investigators to be sufficient to prevent the hardness of the anvil from affecting the hardness of the tested materials. The allowable thicknesses are given to the lowest hardness that can be accurately measured by the particular test and are subject to the slight errors traceable to the non-uniformity of the material, the elastic recovery, and errors in the dimensions of the indentors and in the magnitude of the loads.

The depths of indentations produced by the several tests studied can be found from the following equations:

Diamond Pyramid Test; Depth in inches $= \frac{d}{178.1}$, where d is the diagonal distance in mm.

Rockwell C; Depth in inches $= 0.000085\ (100 - R_C)$

Rockwell B; Depth in inches $= 0.000087\ (130 - R_B)$

Rockwell E; Depth in inches $= 0.000087\ (130 - R_E)$

Rockwell 30T; Depth in inches $= 0.000044\ [100 - (R30_T)]$

Brinell Test; Depth in inches $= \frac{5 - \sqrt{25 - d^2}}{25.4}$

where d is ½ the diameter of the indentation, in inches.

In performing tests on thin material, where shallow indentations are desired, it should be noted that the choice of tests to be used will depend on the hardness of the material as well as on the depth of penetration. This is clearly revealed by comparison of the 5-kg DPH test with the R30T test. At hardnesses above 150 DPH, the R30T test has the shallower penetration, but for hardnesses below 150 DPH, the 5-kg DPH test indentations are shallower. This difference arises from the geometrical shape of the respective indentors used.

Conversion Relationships

Although investigations by S. N. Petrenko[7] have shown that general theoretical relationships between the various hardness scales can be derived, the variations found in the work-hardening capacity of metals render such derived relationships useless and, consequently, hardness conversions must be found by empirical means and for the specific materials and conditions of treatment. Even with empirical relationships, variations will be found if the conditions as regards composition, heat treatment, and cold work differ appreciably as previously described. Thus

(Continued on page 94)

TABLE V

Approximate Comparison of Hardness Scales
British Standards Institution

Diamond Pyramid Scale	Brinell Scale (Steel Ball 3000 Kg)	Rockwell C Scale	Rockwell B Scale (1000 Kg $\frac{1}{16}$ in. Steel Ball)
20	20	..	..
40	40	..	..
60	55	..	..
70	65	..	..
80	75	..	..
90	85	..	..
100	95	..	54
120	115	..	65
140	135	..	77
160	155	..	83
180	175	..	89
200	195	..	94
220	215	..	97
240	235	20	100
260	255	24	..
280	279	27	..
300	295	30	..
320	310	32	..
340	325	34	..
360	345	36	..
380	360	39	..

A plate and structural steel fabricator, making such items as elevated water tanks, spherical storage tanks, steel grandstands, wind tunnels, bridges and buildings, Pittsburgh-Des Moines Steel Co., has found ac welding preferable in its particular operations. This is a section of a large floating drydock.

Steel Fabricator Shifts

Elimination of arc blow, lower power and maintenance costs, and the ability to use larger diameter electrodes added up to considerable savings and resulted in a shift from dc welding to ac welding in a plate and structural steel fabricating shop as reported in this article.

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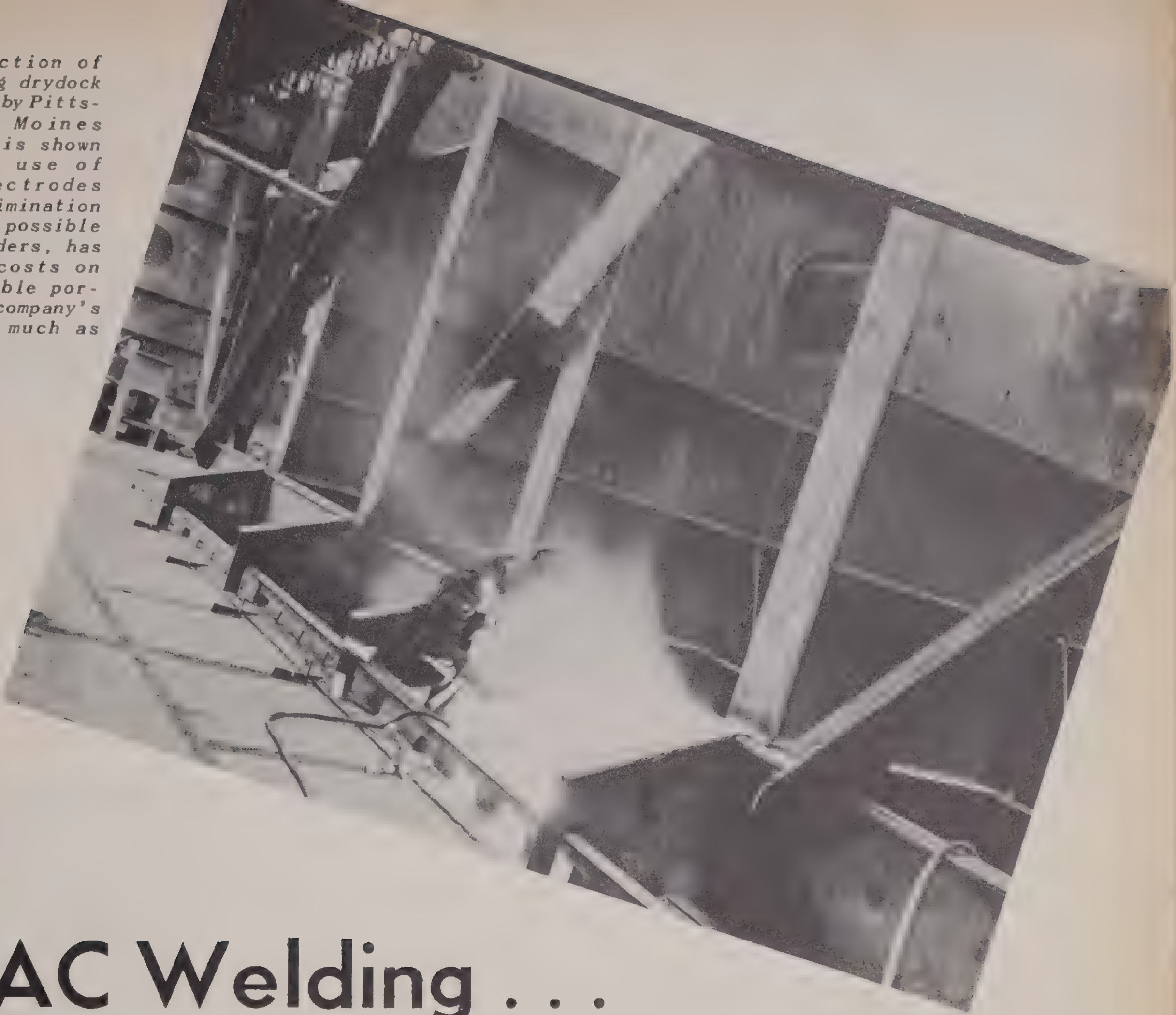
A SHIFT from the use of dc welding equipment to ac welding equipment at Pittsburgh-Des Moines Steel Co., Neville Island, Pa., has been made. About 10 years ago, the shop, which is primarily a plate and structural steel fabricating operation, had about 40 dc welders—motor generator sets—and four ac transformer welding units. Today, there are 54 ac welders and four dc units in use in the shop. For the type of work done by the company, it was found that the improvement in work quality, as well as savings in labor, maintenance and power costs, have justified the changeover.

The trend toward greater utilization of ac equipment started in 1942 when the company became actively engaged in Navy work. At that time, an order was received for 1000 5x5x7 ft pontoons to be fabricated from light steel plate, each pontoon weighing about 2300 lb. Prior to that time, one of the main drawbacks to ac welding was the lack of good electrodes. At that time, however, new ac electrodes were introduced and three Westinghouse ac welders were purchased to handle the pontoon job. As war work in the plant increased in quantity, a few more ac sets were procured during 1943 and 1944. After the war, Pittsburgh-Des Moines purchased from War Assets Administration 30 Westinghouse, 15 General Electric and several Lincoln and Air Reduction ac transformer welders, disposing of the bulk of its dc units.

Ac welding was found by the company to have several advantages over dc for the type of work done in the plant. Arc blow was eliminated. Higher welding currents and larger elctrodes could be used. Maintenance was less. Power consumption was reduced.

Elimination of arc blow is rated as the primary advantage of ac welding because it evidently makes considerable difference in the appearance of the weld and reduces the time re-

Another section of the floating drydock being built by Pittsburgh Des Moines Steel Co., is shown here. The use of larger electrodes plus the elimination of arc blow, possible with ac welders, has cut labor costs on a considerable portion of the company's jobs by as much as 10 pct.



to AC Welding . . .

By FRANK WENDEL
Welding Foreman,
Pittsburgh Des Moines Steel Co.,
Neville Island, Pa.

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quired to lay the weld. A man working in a tight corner can lay down a full length of ac weld in a single pass. Because the weld looks better, it gives the welder a sense of satisfaction with his work.

Steel pipe from 3 to 5 ft diam is difficult to weld on the inside. Because of the smoke and cramped position, the welder wants to get out of the pipe quickly. Ac welding, with no arc blow, enables the man to do the job more quickly. With ac welding, the operator still has the cramped position and smoke to contend with, but the length of time he is inside the pipe is reduced about 25 pct.

The electrode size is important in welding heavy plate. Instead of 3/16 in. electrodes used in dc welding, ¼ and 5/16 in. electrodes have been used with the ac equipment on a large proportion of the jobs. A 5/16 in. electrode at 450 amp gives much faster weld metal deposition than a 3/16 in. electrode at 225 amp, which was previously used. Savings in labor cost from the use of the large electrode and the elimination of arc blow is estimated by Pittsburgh-Des Moines to be in the neighborhood of 10 pct, while on some specific jobs it runs as high as 30 to 40 pct.

Lower maintenance cost for ac welding equipment was also evident. Over a period of several years, the maintenance costs were found to be about $20 a year less for the ac welder than for the dc type welder. Repairs on dc sets involved replacement of brushes, bearings, rheostats and all items normally expected on any revolving device. The principal maintenance on ac welders has been to replace ground cable and welding cable terminals.

Power savings are derived principally from the face that ac welders consume less power when running idle. Dc welders draw 2½ to 3 kw running idle, while the ac units consume only ½ to 1 kw when idle. While the ac transformers are known to be more efficient than dc sets when under partial or full load, the idle load power saving is found to be the more important factor. The annual savings on electricity costs are estimated to be between $50 and $60 on each welding unit operated on one shift basis.

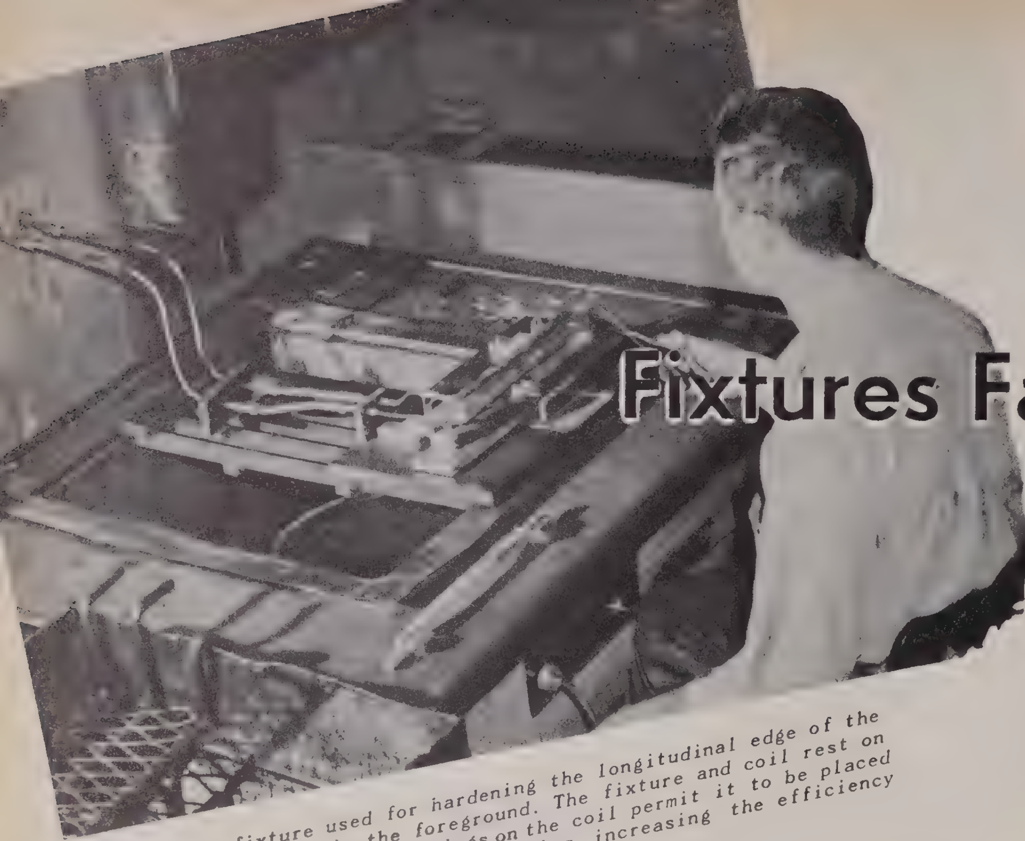

FIG. 1 - The fixture used for hardening the longitudinal edge of the cast iron part shown in the foreground. The fixture and coil rest on a Micarta base and ceramic bushings on the coil permit it to be placed very close to the edge to be heated, thus increasing the efficiency of the operation.

Fixtures Facilitate

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By V. E. HILLMAN
Director of Research
Crompton & Knowles Loom Works,
Worcester, Mass.

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INDUCTION heating as a hardening technique is no better than the fixtures that are designed to hold the parts to be hardened. Likewise flame hardening is greatly enhanced if the fixturing serves the purposes of properly positioning the part to be hardened and reducing the chance of human error by making the work cycle more or less automatic.

Crompton & Knowles, producers of textile looms, has developed fixturing to a high degree for hardening certain areas of castings and steel parts that are subject to wear or abrasion. Previously the castings were hardened by chills in the mold. This method complicated mold preparation; the hardness frequently extended beyond the areas desired and machining of the hardened areas was often difficult and sometimes impossible.

By induction hardening the areas that require hardening after all machining is completed, these disadvantages are overcome. Moreover, there is closer control of the actual hardness obtained, its depth and the extent of the hardened area. While the bulk of the hardening is done by induction heating, in some cases Crompton & Knowles uses flame hardening because it is applied more readily to the particular casting or part involved. Induction hardening is also used on wrought parts to be hardened as well as to heat steel tubes that must be shrunk onto plugs or hubs.

The outstanding factor in the use of induction hardening by this company is in the fixtures designed and employed. As usual, the induction coil employed is designed to closely fit the part to be treated. A refinement of this practice, however, is the extent to which fixtures that include the coil, a means for quickly positioning the work in reference to the coil, and the quenching mechanism are employed. Typical of this technique is the fixture shown in fig. 1. The gray iron casting shown in the foreground is a dobby knife, one longitudinal edge of which must be hardened to engage steel parts that hook over it. This edge was formerly chilled in the sand mold, but the chill often extended to adjacent trunion pins that had to be machined.

The fixture and the coil used for this hardening operation rest on a micarta base which acts as an insulator. The copper tubing that constitutes the coil follows along the area to be heated, but is separated from the knife edge by ceramic bushings that act as spacers and insulators. These bushings permit the coils to lie closer to the work than would be possible if an air gap were used, thus increasing the efficiency of heat input into the part.

Induction and Flame Hardening

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Good induction heating fixtures take imagination to develop but pay off by increasing the efficiency of this heating method as well as increasing the scope of activities of the machine itself. Crompton & Knowles has built many ingenious fixtures for holding cast and wrought parts during heating, some of the more outstanding of which are described in this article.

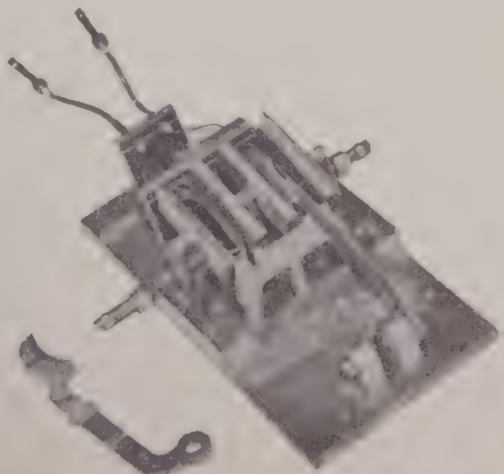
A 550 v, 30 kw Lepel generator is the power source, to which the tubular coil is connected by standard unions. The induction coil is water cooled in the usual manner. For this operation, it requires 80 to 90 sec to heat the surface to be hardened to 1600°F. Timing is automatically controlled, and when the current is cut the casting is removed by the operator, using tongs, and dropped into an oil quench. Subsequently, these dobby knives are tempered in batches in an oven for 2 hr at 400°F. The hardened area is 550 Bhn or harder, too hard to be filed.

In setting up a heat treating job, care must be exercised to heat at a suitable rate and quench in a manner that will yield the desired hardness without cracking the part. Some experimental work is required in designing a coil that will heat as desired, in timing the machine to raise the temperature at the proper rate, and in applying the quench at the proper instant in the cycle. In many cases water is used for quenching and is applied in jets from fine holes drilled in the fixture. The water is directed on the part to be quenched under pressure through a valve which opens automatically immediately after the current through the heating coil is shut off.

Among the parts that are water quenched in this manner are indicating levers, one of which is shown in fig. 2. These levers have a crescent shaped lip at one end, and only the curved inner face of the crescent is hardened. A two place fixture, shown in fig. 2, is used, and it includes a pair of coils having four turns each. On either side of each coil is the quench mechanism, consisting of a water line terminating in a box-like head. The face of the quench head is a drilled plate with the jet holes so placed and spaced that an equal amount of water is directed over the entire heated area. In this fixture, two of these indicating levers are heated and quenched simultaneously.

Another loom part that is hardened locally is a cast iron lock-knife cam, shown in fig. 3. The

FIG. 2 - The inner face of the crescent shaped end of the part shown in the foreground is heated and quenched in this fixture. The fixture accommodates two parts simultaneously, and the quench spray is directed on the heated area from both sides of the part through the box-like spray heads.



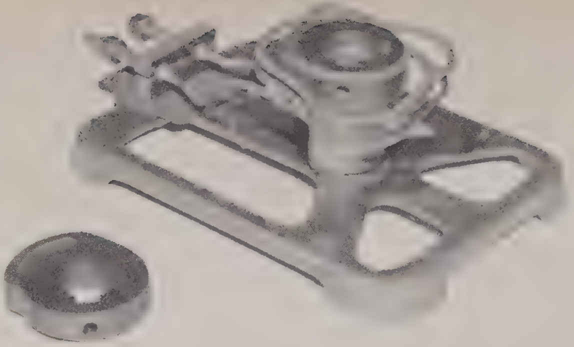


FIG. 3 - This simple fixture is used for heating the outside periphery of the cast cam shown in the foreground. When removed from the fixture by tongs, the part is dropped into an oil quench.

fixture consists mainly of a base plate, a positioning stanchion and the heating coil. The coil is 2¾ turns of tubing, which is flattened to provide faster heating. The coil follows the external contour of the area to be heated, and a clearance of ⅛ to ½ in. is maintained between the coil and the casting when the latter is positioned for heating. When the periphery surface of the cam reaches 1600°F, the current is cut automatically and the cam is removed with tongs and dropped into an oil quench. The part is later tempered at 400°F for 2 hr and the depth of hardness on the piece ranges from 0.075 to 0.100 in.

Another double fixture positions two pawl castings each of which has one end hardened. Two castings are placed in holders and anchored by U-shaped springs that project over the unheated end. Fig. 4 shows the fixture, the left station of which is loaded in the holder and positioned for heating and the right holder is empty. The part is shown in the foreground. These holders slide in a machined way in the bottom of the fixture up to a fixed stop. In that position, the ends of the pawl are in the induction coil, which cannot be seen in the photograph because of the water jacket. Water quenching automatically follows the heating. The end of the pawl is hardened to a depth of about ⅛ in.

Many other cast parts are similarly treated, each in a special fixture, part of which is the coil designed to heat the particular area to be hardened. The accurate and certain positioning of the part in the induction coil by the fixture is evidenced by the results obtained by this method of heat treating. Furthermore, on a given part the results are consistent because of the infallibility of the mechanical operation and the automaticity of the work cycle, leaving little or nothing to the judgment of the operator.

Among the steel parts that are hardened by induction heating are forged dobby hooks, which, in assembled looms, operate in conjunction with the cast dobby knife shown in fig. 1. These dobby hooks are made from SAE 1035 carbon steel and have a pin eye in one end and a hook in the other. After all the machine work on the part is completed, both the eye and the hook ends are hardened in a semi-automatic setup.

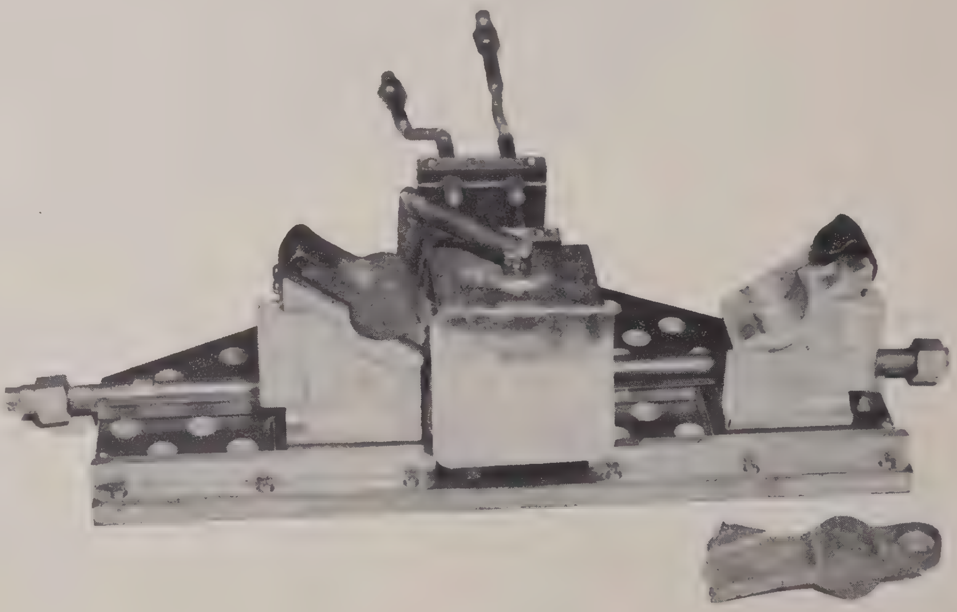


FIG. 4 - For simultaneously hardening the ends of two pawl castings, shown in the foreground, this two-place heating and quenching fixture is used. Placed in the fixture under the spring, the part and holder slid into the coil (not shown), heated and quenched. The box-like arrangement in the center of the fixture is the quench housing.

In the hardening arrangement, shown in fig. 5, a pair of V-belts, motor-driven at a speed of about 4 fpm carry the hooks into the heating zone. A loading operator places the hooks about 3 in. apart transversly across the two belts. The belts advance the hooks so that the ends of each part pass between five convolutions of the heating coils. As can be seen in the photograph, there is an individual C-shaped coil for each end of the part. This produces a heating slot through which the ends of the forgings are traversed by the belt.

The belt moves continuously and as the traverse proceeds the hook and the eye ends of the part attain a red heat. Just as the desired temperature is reached, the parts leave the heating area, the belt makes a downward turn around an idler pulley, and the forgings drop into an oil quench. In this setup, 4500 hooks are heated and quenched in a 8-hr shift. Heating is automatic and the temperature attained in the ends of the forging depends, for a given applied current, upon belt speed. The belt speed can be adjusted to the work and the work cycle is automatic except for hand loading of the belts. This loading is done at a position well away from the heating zone and the oil quench tank is normally covered with a hood to exhaust any fumes that might develop from the hot parts dropping into the oil. The hood was removed in order that the photograph, fig. 5, would show the entire coil, fixture, and quench arrangement.

Hardening by this technique is not only rapid but highly uniform. Hardnesses of 50 to 55 Rc are obtained without the formation of scale on the forgings. They are ready to use after removal from the quench tank and drying.

Another type of work done by induction heating is the expanding of tubular rolls preliminary to shrinking them onto gudgeon pins or hub castings. This work is done in a Tocco machine, shown in fig. 6, using coils 2½ to 6½ in. ID. The coils are made only slightly larger than the OD of the pipe or tube to be heated. For the heating coils, ¼-in. copper tubing of square cross section is used, partly because this shape affords greater coil surface area close to the steel tube to be heated and helps speed heating.

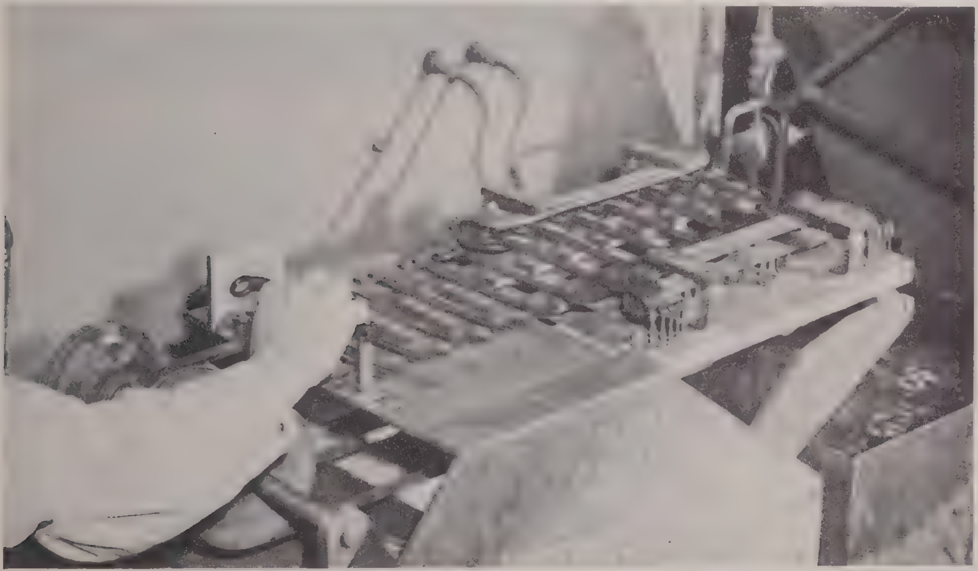


FIG. 5 - Forged steel dobby hooks laid on rotating belts are advanced automatically through induction coil slots for heating. As the belts reverse the travel direction over idler pulleys, the forging drop into an oil quench. An exhaust hood normally covers the heating area and quench tank.

Heating is also expedited by having the coil as tightly wound as possible. As the coil turns must not touch each other, they are insulated by slipping over them flexible sleeves of woven fibre glass painted with Glyptal enamel. To avoid deflection and provide insulation, the coil is set in a bracket. This bracket consists of close-fitting holes machined in two heavy sheets of Transite, one at either end of the coil, with the Transite holders mounted on a Micarta base. The coil mounting can be seen in fig. 6.

On coils 4 in. or greater in diameter, a supplementary reactor or choke coil is used in series with the heating coil. This is placed to one side, but not coaxial with the main coil, in order to promote faster heating of the work. The steel tube to be heated is set on trunion blocks that hold its axis in the axis of the heater coil. The positioning of the tube in fig. 6 is not correct for actual heating, since during heating the end of the tube is in the same vertical plane as the end of the coil.

Heating a 2-in. length of 3⅜in. tubing having a 3/16 in. wall to a cherry red—1400 to 1500°F —requires only 30 sec. When the desired temperature is reached in the tube, the current is automatically shut off and the pin or hub, previously machined to the correct diameter and held at room temperature, is slipped into the hot end of the tube by hand. It is set to the correct axial position, and shrinkage of the cooling tube results in a tight fit and eliminates any welding of the tube to the hub.

While some tubes were formerly shrunk on after heating in a furnace, it was difficult to control the temperature because the tube had to be removed from the furnace and held while the hub was inserted. In some instances, drilling and pinning was necessary.

Crompton & Knowles also flame hardens some castings, mainly those too large to be handled on any induction heating equipment in the plant. In some cases the work is done by conventional hand-held torch, followed by a jet of water, as in the case of external cam surfaces. One of the

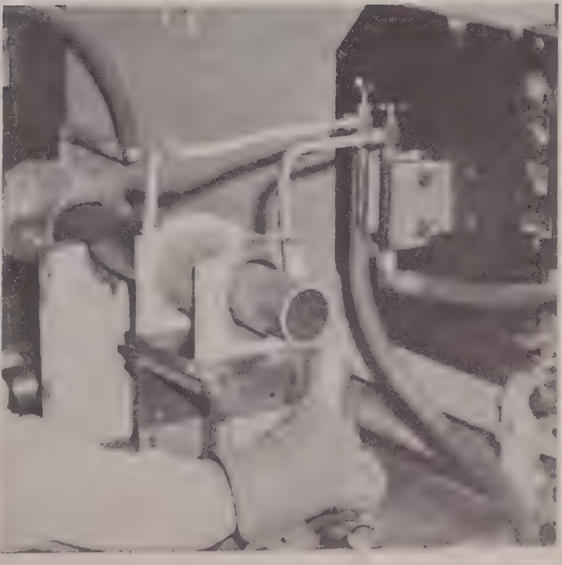


FIG. 6 - This arrangement is for heating the ends of tubes to expand them sufficiently to insert a hub or gudgeon pin, around which the tube shrinks in cooling.

most ingenious automatic fixtures in the plant, however, is that used in flame hardening the side faces of track cams which are about 20-in. diam and of irregular shape. The fixture, motor driven, is shown in fig. 7.

In this fixture, the cam being hardened is turned slowly by a gear reducer while the flame and quench jet play in the track and against the faces to be hardened. Because the track varies in distance from the center of rotation, the torch and water jet are mounted on a spring-held slide that moves in and out in correct relation to the areas to be hardened.

To accomplish the correct positioning of the slide, and consequently the flame and water jet, the slide is driven by a roller running in the track of a second cam that is a duplicate and set in the same phase relation of the cam being hardened. In this manner, the flame and water jet are always in the same relative position to the area being processed because their position is governed by the cam track itself. Hardening is extremely uniform.

Heating is done with an oxyacetylene flame that is adjusted, as to gas flow, to produce a uniform heat. The torch has a special head to give a flame of the desired shape. As the water jet is below the torch head, the water runs away from the flame and drips into a pan. It takes about 20 min to flame harden a cast iron cam of the size and type shown in fig. 7. However, once set, the fixture runs through its cycle with little or no attention. Hardness depth can be varied, but is commonly held to about 0.050 in.

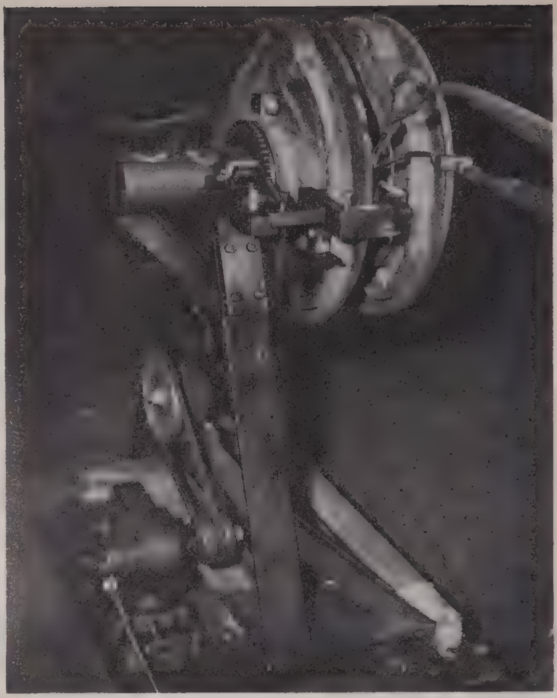


FIG. 7 - In flame hardening the side faces of a track machined in the cam at right, a duplicate casting acts as a guide track actuating the slide upon which the torch and water-jet are mounted. A gear and belt reducer turns both cams slowly and little attention is required once the work cycle has started.

Hardness Testing of Soft Metals

(Continued from page 87)

any general table of conversion relationships can only be a general approximation so that table IV should serve solely as an indication of the order of the relationships between the several systems. The values included in the table are found from curves drawn through the average of hardness data obtained on many representative metal and alloy specimens so prepared as to eliminate as many of the variables as possible, fig. 5.

For purposes of comparison, hardness conversion relationships published by British Standards Institution are included herein, table V. Examination of this table will reveal that the agreement among all three are not sufficiently close to meet specifications of hardness limits often employed in commercial heat treatments.

More accurate conversion relationships will be obtained if they are restricted to materials possessing similar properties. The American Society for Testing Materials in conjunction with the American Society for Metals and Society of Automotive Engineers are preparing conversion charts based on such considerations. For the sake of accuracy in covering all metals, therefore, several tables will be required instead of one.

With adequately trained inspection personnel and accurately calibrated hardness testing apparatus in good working order, reliance can be placed on obtaining reasonably close hardness conversions from carefully prepared charts. For this reason the new charts being prepared will go far in resolving some of the existing difficulties in meeting standards and specifications now so widely employed.

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References

1. H. Scott and T. H. Gray, "Relationship Between the Rockwell C and Diamond Pyramid Hardness Scales," Trans. ASM, vol. 27, 1939.

2. E. Meyer, "Untersuchugen uber Harteprufung und Harte," Zeitschrift des Vereines deutscher Ingenieure, vol. 52, pp. 645, 740, 835: 1908.

3. H. O'Neill, "The Hardness of Metals and Its Measurement," Sherwood Press, Cleveland, 1934.

4. S. C. Hoyt, "The Ball Indentation Hardness Test," Trans. ASST, vol. 6, p. 396, 1924.

5. R. H. Heyer, "Analysis of the Brinell Hardness Test," Proceedings ASTM, 1937.

6. Westinghouse Research Data.

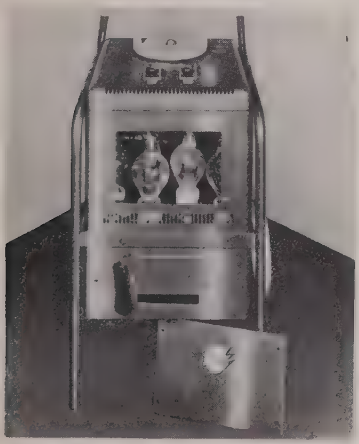
7. S. N. Petrenko, Bureau of Standards, Journal of Research 5:19, 1930.

New Production Ideas . . .

Ac-dc arc welders, a zinc diecasting machine, special machines for broaching piston pin bushings, for finishing automotive cylinder blocks, and for wheel riveting, an automatic shear, a sandslinger, a cylindrical parts gage, strapping tools, an automatic staking machine, aluminum lacquer, and a rack coating are new and improved equipment described in this issue.

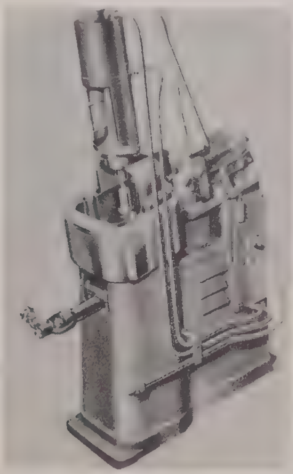
Ac-Dc Welder

COMBINATION ac-dc arc welders, in which the choice of current is made by setting two switches and a hand lever, have been designed by the *John A. Kern Co.*, 224 N. Loomis St., Chicago 7. Model 20DA has a dc range of 5 to 60 amp and an ac range of 25 to 200 amp. Model 25DA has a dc range of 5 to 90 amp and an ac range of 25 to 200 amp. Rectifier tubes supply dc power, and the manufacturer claims that idling losses are reduced 50 pct, power consumption under load is decreased, and maintenance costs are reduced as compared to conventional dc motor-generator machines. Instant arc response eliminates surging and spatter, and straight or reversed polarity electrodes may be used. The easy striking and stable arc, combined with accurate amperage control, makes the dc welder ideal for inert gas shielded arc welding. The ac welding characteristics of the machine include smooth, instant starting; stable arc action; and quiet, vibration-free operation. Inert gas shielded arc welding performance with ac operation has been found excellent when a high frequency current is introduced into the circuit.



Zinc Diecasting Machine

QUICK, economical casting of small parts in zinc alloy, utilizing low cost single-cavity dies operating at high speed is possible with a small air-operated diecasting machine announced by *DCMT Sales Corp.*, 315 Broadway, New York. Features include optional hand and foot controls and an air system with pilot and ram valves integral. Toggle links are forged clevis hardened steel. The machine carriage is undercut for downpulls and ejecting large castings. The pot uses hydraulic suction to fill the cylinder. A porthole at the base of the pot allows all the metal in it to be used before refilling becomes necessary. Ejector boxes are quick-release type.

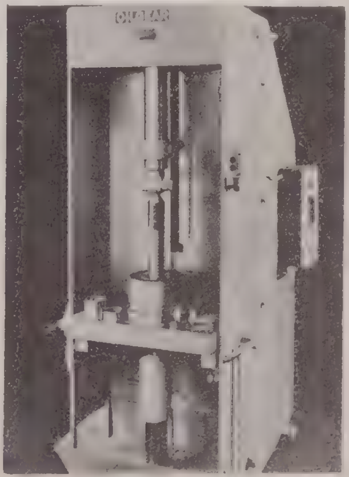


Fluted Welding Electrodes

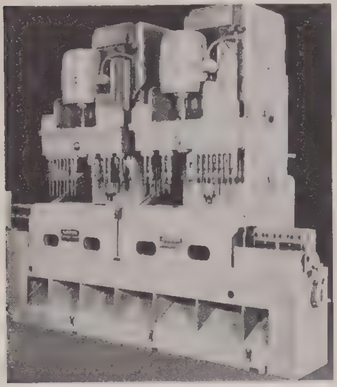
INTERNAL fluting in the side of the water hole of a new resistance welding electrode is said to provide 70 pct more water cooling area, increase the strength and rigidity of the electrode, and provide automatic centering of the water cooling tube. These factors, *P. R. Mallory & Co.*, Indianapolis, claims, combine to increase the life of the electrode and quality of the weld produced, and eliminate distortion under pressure.

Special Broaching Machine

UP to 30 internal 10° helical oil grooves are broached in one pass in 3-in. bore and other sizes of SAE No. 64 bronze connecting rod piston pin bushings for large diesel engines on a 15-ton sideplate press manufactured by *Oilgear Co.*, 1301 W. Bruce St., Milwaukee 4. Other 10° helical grooves 1/32 in. wide by 1/32 in. deep are also broached in the lower half only of large bushings. Production at 85 pct efficiency is 125 finished bushings per hr. An Oilgear two-way variable delivery pump is enclosed in the press frame. Stroke of the machine is 30 in.; daylight opening 36 in.; throat, 8 in. Broaching speed ranges up to 195 ipm; return speed up to 385 ipm.



Cylinder Block Machining



FOUR finishing operations on automotive cylinder blocks and a continuous automatic material handling device are featured in a machine developed by *Cross Co.*, Detroit 7. Four cylinder blocks are machined at one time progressively. At the first station, eight valve guide bushings are rough reamed; at station two, four exhaust valve insert parts are counterbored; at the third station, four intake valve seats are formed; and at the fourth station, the eight valve guide bushings are finish-reamed. Mechanical features include a single lever cycle control, hardened and ground steel ways, hydraulic feed, rapid traverse, and simplified maintenance. Transfer, locating, and clamping are handled automatically.

Flaring Tool

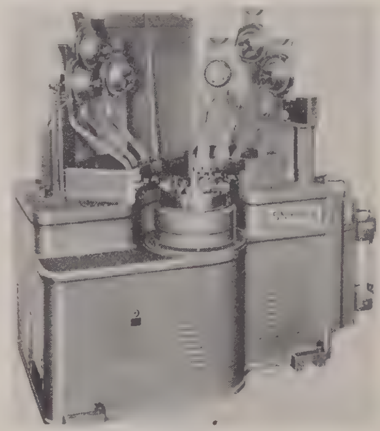
FASTER operation, better flares, compactness and elimination of scoring of tubing are advantages claimed for the new Hi-Duty flaring tool announced by *Imperial Brass Mfg. Co.*, 1200 W. Harrison St., Chicago. The tool flares soft copper, brass and aluminum tubing for SAE flare joints in ¼, 5/16, ⅜, ½ and ⅝ OD sizes. A die holder with sliding dies clamps the tubing and a thumb screw at the end tightens it. The die assembly is made of heat-treated steel and the yoke is of forged steel.

Air-Clamp Jig Base

FLOOR to floor time for drilling identical parts in production drilling is said to be reduced with the use of a pneumatic work-holding fixture, the air-clamp jig base, introduced by *Industrial Clutch Corp.*, Waukesha, Wis. The clamp operated on 50-lb pressure and throw may be limited to facilitate insertion and removal of work. Variations in thickness of the pieces to be drilled are said to be automatically compensated for by air pressure. In repetitive operations the piece slides into position on the base under the jig plate and air pressure applied. Four sizes of this accessory are available and special sizes may be ordered. Each jig base will accommodate several sizes of jigs.

Wheel Riveting Machine

PRODUCTION of 200 wheel assemblies per hr at 80 pct efficiency is claimed for a riveting machine that automatically inserts 12 rivets in an automotive wheel assembly. On this machine, manufactured by *Snyder Tool & Engineering Co.*, 3400 E. Lafayette St., Detroit 7, the riveting operation is performed automatically after the wheel assembly is located on a fixture. Six rivets are inserted simultaneously. The wheel assembly then automatically indexes 180° and six more rivets are inserted. Six automatic feed hoppers feed the rivets to the wheel assembly where hydraulically actuated plungers pick the rivets out of the hopper chutes and carry them into the pierced rivet holes in the wheel assembly. Floor space required for the unit is approximately 45x57 in.



Recessing Tool

FOR precision recessing where tools must work through jigs or fixtures, a recessing tool has been designed by *Maxwell Co.*, 520 Broadway, Bedford, Ohio, which is available in three sizes to machine diameters ranging from ½ to 2-3/16 in. These tools are made to pilot into standard bushings and operate on any manual or automatic feed spindle. The diameter of the recess is governed by the actuating stroke of the tool which is set by adjustment of the stop collar when used on manual feed spindles. Distance from the face of the work to recess is controlled by adjusting the ball bearing stop bushing. Cutters can be interchanged by releasing the combination positive lock and friction clamp and tool shanks are also interchangeable. Various types of cutters such as radius, multiple-groove, and others may be used. Shanks are furnished in Brown & Sharpe, Morse taper, adjustable adapter, quick-change and straight types, or to meet individual specifications.

Material Level Indicator

CHANGES in material levels in very small hoppers, spouts, chutes, and conveyers, can be signaled with the Bantam Bin-Dicator designed by *Bin-Dicator Co.*, 14615 E. Jefferson Ave., Detroit 15. The instrument, which is a diaphragm-operated switch in sealed housing, automatically starts and stops filling and emptying equipment as the level of material reaches designated limits. It can be used on bulk materials weighing 2 to 350 lb per cu ft. A special arrangement of the micro switch is provided in units to operate on light materials.

Automatic Shear

SHEETS and plates in odd and irregular shapes can be sheared, flanged and formed with a new automatic shear, using rotary shears, made by *Kling Bros. Engineering Works*, 1318 N. Kostner Ave., Chicago 51. Once the sheet or plate has been placed in position, the operation is guided automatically and pencil-point precision assures uniformity in the finished product. Positioning is obtained by holes in the heads or tack welding small

collars to the bottom side, removing them when the operation has been completed. Minor adjustments correct the variations for increasing or decreasing the size of the heads. The automatic shear can be adapted to any machine employing circular cutting, flanging or forming rolls. Handling of any thickness of sheet or plate is possible.

Remote Cylinder Control

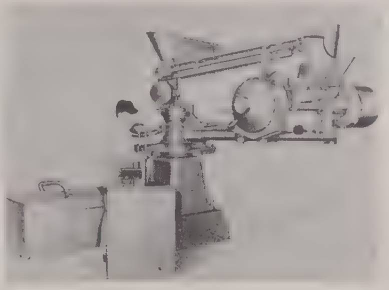
HYDRAULIC cylinders with power output up to 7500 lb can be positioned with 0.1 pct accuracy from points 1000 ft or more from the cylinder, according to *Askania Regulator Co.*, 240 E. Ontario St., Chicago 11, which has introduced a heavy duty electronic remote control positioning system. The system consists of two station control; a remote transmitter station and a transmitter and amplifier station; hydraulic crank type cylinder; and the receiver mounted on cylinder. The position of the cylinder crank arm can be selected at either control station. An electric signal of the position selected is transmitted to the receiver which operates a pilot valve positioning the crank arm at any point within its 90° arc. The output position can be selected manually or automatically from signals developed by plant processes or operating conditions.

Flexible Shaft Machine

A NEW type countershaft mounting spaced above the motor tilt axis gives to the improved flexible shaft machine designed by *Elliott Mfg. Co.*, Binghamton, N. Y., adequate endwise yielding motion to the flexible shaft as the operator tilts the motor assembly. The new countershaft includes a vertical adjustment operating on a lead-screw principle, with finger-tip control. With a standard three or four step cone-pulley on the motor shaft, the vertical adjustment is operative through 4 in. to provide positive and accurate belt tensioning. Nonravel flexible shafts of cold-worked music-wire operate within reinforced rubber cases.

Sandslinger

THE new Hydra-Slinger is a stationary type sandslinger with hydraulic power controlling and directing the movement of the ramming arms. Designed by *Beardsley & Piper*, 2424 N. Cicero Ave., Chicago 39, the machine provides maximum production in molding units where the flasks and patterns move into the ramming area. Movement of the ramming head is directed from a control station which may be placed at locations adjacent to the ramming area and may be at floor level or elevated to provide desirable visibility. Arm lengths range from 10 to 15 ft and ramming capacities, 7 to 15 cu ft.



Rack Coating

AN improved single-dip heat cured rack coating described as a 100 pct solid coating that produces a tough, smooth, leather-like coating with a single application has been marketed under the name of Miccrosol E-1003 by *Michigan Chrome & Chemical Co.*, 6340 E. Jefferson Ave., Detroit 7. In addition to insulation and protection the coating is claimed to provide flexibility, adhesion, and scuff resistance with simplicity of application where commonly used plating solutions are employed. One coat is required over the primer. Racks are processed and ready for use in approximately 2 to 4 hrs.

Outside Measurements Gage

FOR checking concentricity and diameters of cylindrical parts, the Ridermikrokator has been announced by *Swedish Gage Co. of America*, 8900 Alpine, Detroit 4.

As measurements are carried out according to the three point principle the instrument can be used for checking centerless-ground pieces. Frames are made of malleable cast iron. Anvils and insulating grips are hardened, ground and lapped. The measuring surfaces can be tipped with cemented carbide. The measuring instrument is a standard mikrokator No. 220 which is locked in the frames by a screw. This instrument is supplied with a removable measuring point in two sizes, with ranges from 3/16 to 2 ⅜ in. and 2⅜ to 4¾ in.

Temperature Controller

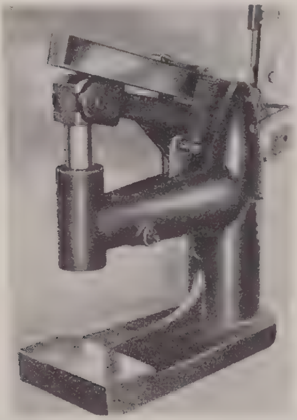
A TEMPERATURE controller, developed by *Thomas A. Edison, Inc.*, West Orange, N. J., uses a single electronic tube with an electrical resistance type bulb for thermal pick-up and is the on-off type. The use of the resistance bulb permits location of the sensing element at a point remote from the control panel and eliminates the necessity of thermal compensation. This device, which is non-indicating, may be used to control temperatures to close tolerances in solids, gases, or liquids. Units are available to cover temperature range from —100° to 1200°F. Supply voltage may be 115 or 230 v, 50-60 cycle ac. Normal response time is said to be under 3 sec.

Strapping Tools

APPLYING flat steel strapping to packs where strapping operating surface is limited, is facilitated with the stretcher and sealer announced by the Strapping Div. of *Acme Steel Co.*, 2840 Archer Ave., Chicago 8. The use of these tools for insulation work and for bundling and tying units of small diameter is said to be unlimited. Tight straps can be placed around packages as small as 1 in. in diam. The tools are streamlined and lightweight.

Automatic Staking Machine

STAKING or riveting fixed or movable joints can be done with an automatic staking machine manufactured by *High Speed Hammer Co., Inc.*, 313 Norton St., Rochester 5, N. Y. It is adaptable for such operations as eyeletting, inserting grommets, burring, and pointing with platinum, tungsten, or silver. The hammer blow is adjustable for the amount of pound blow required for particular assembly jobs, and this action is said to be uniform regardless of variations in the thickness of parts being staked or riveted. Four models are available in either manual or motor driven types.



Turning Roll

THE Model 120 tank turning roll which has been redesigned may be moved about the shop and will handle work up to 12 ft diam with capacity for one power and one idler unit rated at 12,000 lb, and for one power and two idler units at 18,000 lb. The roll, which is manufactured by *Reed Engineering Co.*, P.O. Box 415, Carthage, Mo., rotates tanks and other cylindrical shapes for either manual or automatic welding and also for positioning tanks in flame cutting, painting, etc. Standard equipment includes ¾-hp motor, dual rubber-tired wheels, and totally enclosed worm gear reduction drive. Variable speed drive gives any welding speed from 5 to 40 ipm. Reversing drum control and 30 ft of flexible control cable for remote operation is also included as standard equipment. Power unit is 112 in. long x 34 in. wide.

Safeguard for Gas Burners

FIREYE System FF-6, introduced by *Combustion Control Corp.*, 77 Broadway, Cambridge 42, Mass., provides electronic flame failure protection and semi-automatic ignition control, for commercial and industrial gas burning equipment and for oil fired equipment having continuous gas pilot ignition. It is recommended for use on boilers, ovens, furnaces, kilns, and dryers. The device includes an electronic flame rod and a control unit. The flame rod is mounted near the gas pilot on the burner plate and projects into the fire chamber, the tip impinging on the pilot or main gas flame. The rod is wired to the control which may be located at any convenient point. When flame fails, the flame rod signals this condition to the control which cuts off fuel. It can be wired to sound an alarm.

Hand Truck for Pipe

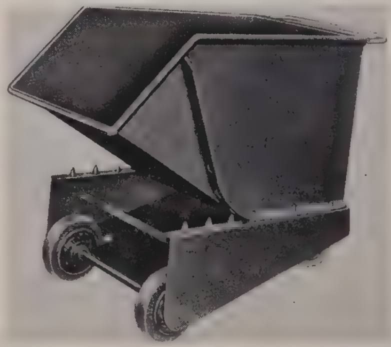
FOR handling pipe, tubing, bar stock, rods, molding, and other long narrow pieces, a hand truck known as the Tol-Away tubing truck, has been manufactured by *Beall Pipe & Tank Co.*, 1945 N. Columbia Blvd., Portland 3, Ore. Made of welded aluminum tubing, this truck is lightweight and has 4 steel casters. Its dimensions, 6 ft long x 24 in. wide x 34 in. high, permit easy operation in aisles and facility in turning corners. Loads are carried on a U-shaped rack between upright standards.

Aluminum Lacquer

FOR a bright, durable protective finish on ferrous surfaces, Liqui-Plate, a new baked aluminum monolacquer has been developed by the *Multi-Coat Corp.*, 33 Bedford Glenns Rd., Bedford, Ohio. The coating works equally well on surfaces that have a phosphate coating. Spray, dip, flow-coating or roller coating can be used. The paint is made to fit various special temperature or time cycles, whether baking is by infra-red or by atmosphere ovens. It is available in 5 and 55 gal containers.

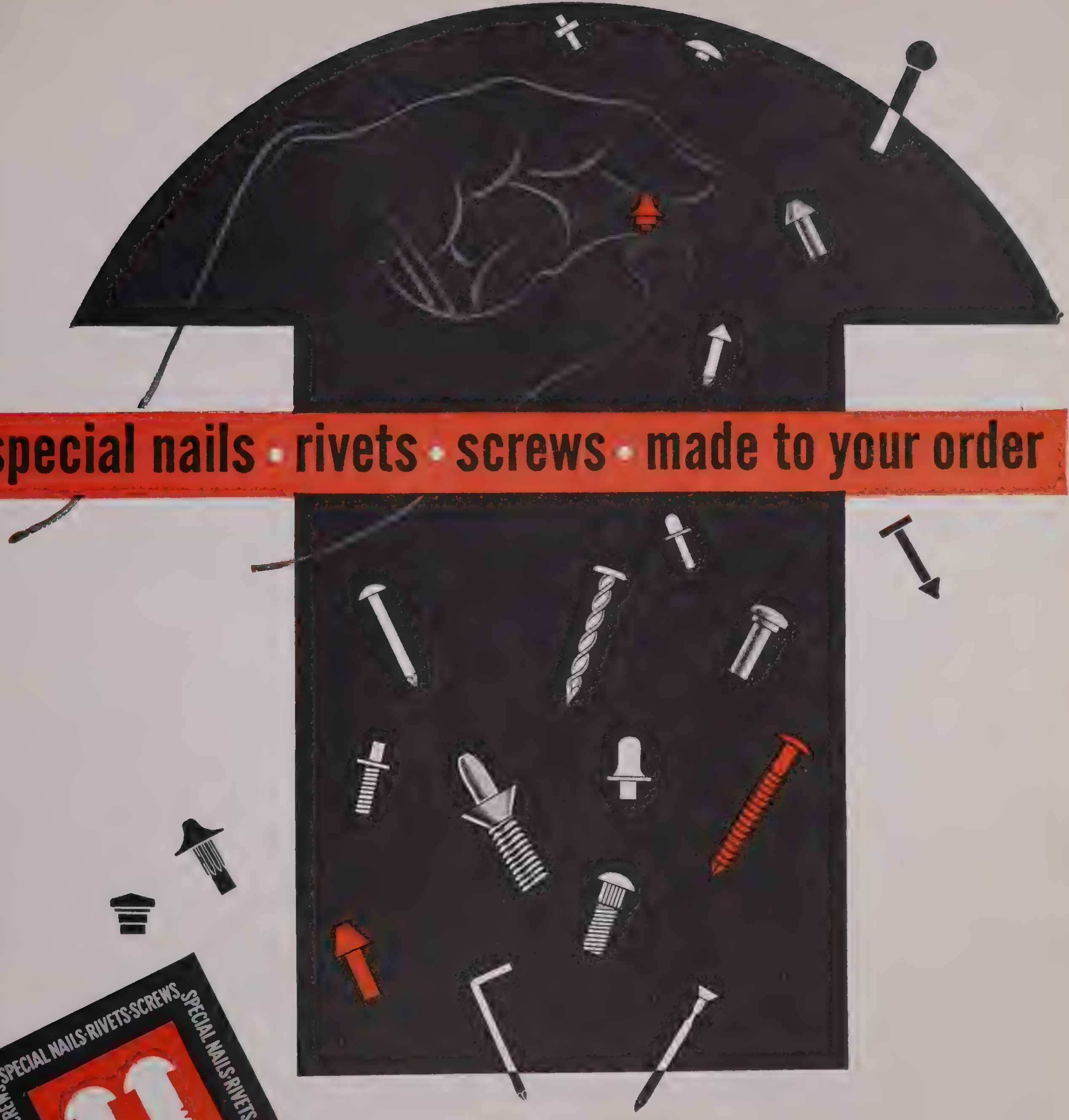
Dump Truck

FOR hauling and dumping industrial materials, an improved Phil-Dump truck has been announced by *Phillips Mine & Mill Supply Co.*, 2227 Jane St., Pittsburgh 3. With overall dimensions of 48x28x38 in. and a capacity of ½ cu yd, this model can be hand pushed or used with a fork lift truck. Special processed tires afford floor protection.



Panel Boards

FOR holding any type of control or indicating instruments and designed to permit additions, interchanging, removal or modification after erection, standard-size, sectional, steel panel boards have been announced by *K & H Industrial Products*, Dept. 13, Akron 11, Ohio. Sections 18, 20 and 24-in. wide are supplied regularly in 6, 6½, 7, 7½ and 8-ft lengths. Each panel has a 2-in. minimum return flange on all four sides. Floor or wall braces are furnished. Panels have lacquered finish which will be supplied in specified color.



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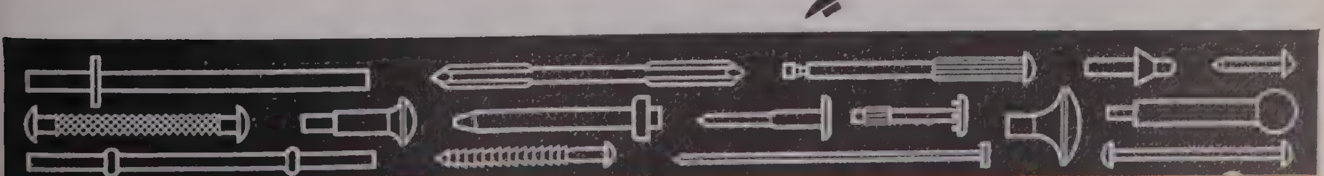
HASSALL cold-heading may solve your immediate special part problem...Special nails, rivets and threaded parts made in diameters from 1/32″ to 3/8″—lengths up to 7″...Rivets 3/32″ diameter and smaller a specialty...Variety of metals, finishes and secondary operations...Economy, quality and quick delivery in large or small quantities...Tell us what you need...We will answer promptly. ASK FOR FREE CATALOG. 3-color Decimal Equivalents Wall Chart free on request.

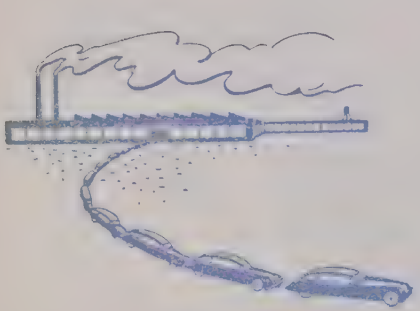


JOHN HASSALL, INC. · 405 OAKLAND STREET · BROOKLYN 25, N. Y.

Assembly Line . . .

WALTER G. PATTON

• Automotive wage pattern set at 11¢ and 13¢ . . . Briggs contract signed . . . K-F establishes a Social Security program . . . Resistance welding research program planned.



DETROIT — The automotive industry's 1948-49 wage pattern appears to have settled between 11¢ and 13¢ increase for hourly-rated employees. During the past 10 days, Chrysler, Briggs, Nash, Studebaker and Kaiser-Frazer have signed with the union on the 13¢ line. Up to the present time GM stands alone with its 11¢ increase tied to the cost-of-living index.

Last week GM announced the terms of the wage increase being granted to 75,000 salaried employees. In addition to an immediate raise of 4 pct, GM white-collar workers will get a $25.00 quarterly bonus, adjustable with the cost of living. The bonus will rise or fall by $5.00 amounts contingent on a 1.14 fluctuation in consumer price index of the U. S. Bureau of Labor Statstics.

At the moment the development of a possible disappointment for workers in the GM agreement occasioned by a drop in the cost of living seems very remote. Rather, the increased demands for all types of consumer goods plus heavy foreign commitments for food and other items seems destined to push the cost of living index and GM wages still higher.

The difficulty of establishing the GM sliding pay formula as a wage pattern is illustrated by events in Detroit this week when 5000 skilled toolmakers in more than 80 Detroit shops went on strike. The union which is demanding a 15¢ per hr increase plus fringe demands totaling a minimum of 5¢ was offered the GM package including the 3¢ yearly improvement factor. The union declined even to negotiate on this basis.

FARMER'S FRIEND: The extent to which mechanization has moved to the farm is aptly demonstrated by this Ford tractor shown at work. By merely fastening six bolts, the farmer can convert his tractor to such diversified tasks as excavating and moving dirt, lifting and stacking baled hay, shoveling and elevating grain or clearing snowdrifts.

The final die shop offer spurned by the UAW-CIO Local 155-157 was a wage increase of 11¢ per hr plus an additional boost of 3¢ at the end of this year.

According to a spokesman for the tool and die shops, average wage rates on a straight time basis for Detroit tool and die makers is now $2.09 per hr. In addition, the workers have paid vacations and what is reported to be more liberal paid holiday allowances than the GM contract. Including all types of workers, average earnings of Detroit tool and die workers have been $103 per week during 1948, according to informed sources.

* * *

Paid holidays are no longer fashionable in Detroit labor contracts. In the recent Briggs agreement, hourly paid workers received a boost of 13¢ an hr plus an additional increase of 3½¢ in lieu of six paid holidays. A recent decision by the Ford labor umpire has been a factor in abandoning the paid holidays. In addition, union representatives argued that this money could be more fairly distributed on a straight time basis. Most holiday contract clauses require the employee to work both the day before and the day after a holiday. Originally it was believed this requirement would prevent exessive absenteeism in the plants. It is doubtful if such gains were actually realized.

* * *

UNDER the terms of a new agreement the Briggs contract has been extended from Apr. 28, 1949 to Aug. 1, 1950. The contract can be opened once by either party for discussion of genral wage rates, after June 15, 1949. The agrement becomes effective June 5 if ratified before June 22.

This week Briggs paid an estimated $1,650,000 to its hourly paid workers as vacation allowance. This is at the rate of $57 to each employee having up to 5 years seniority. Employees with Briggs more than 5 years received $114. Next

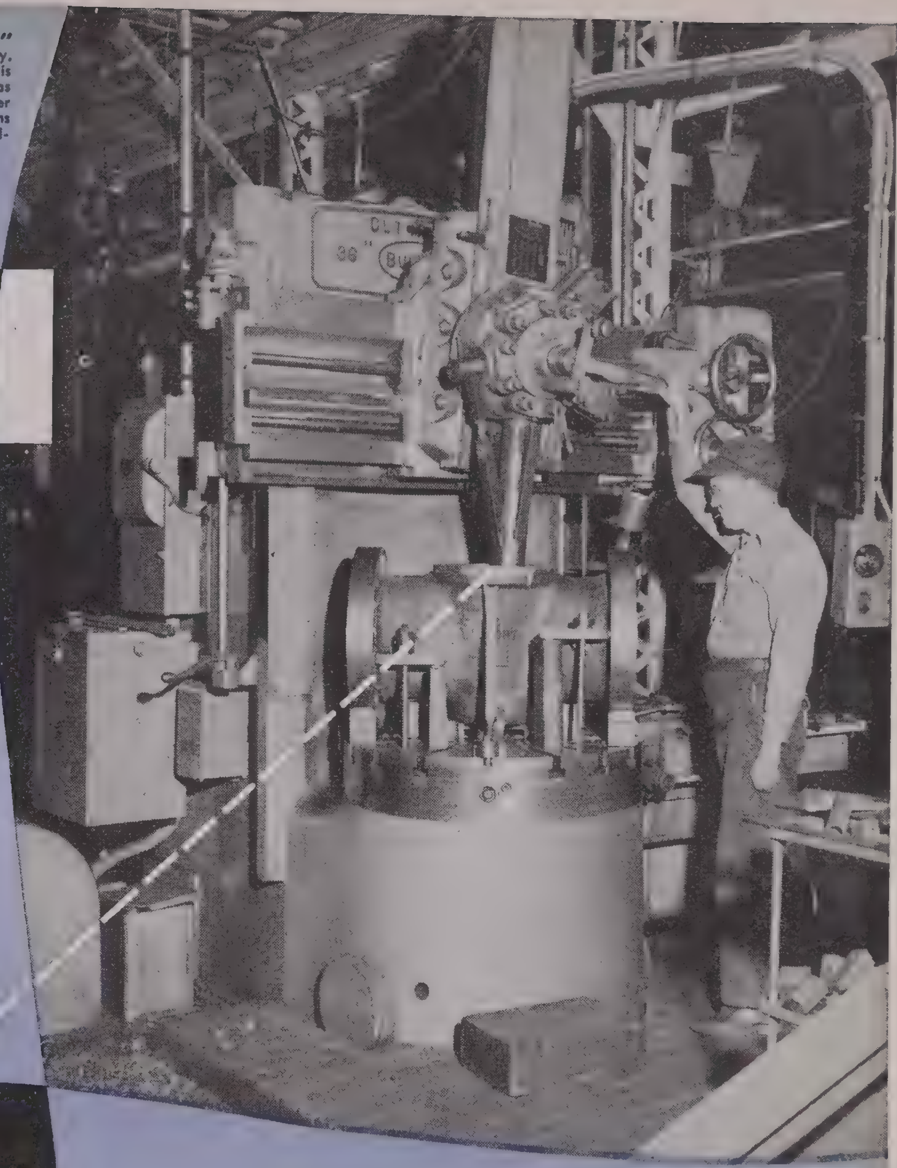
This BULLARD 36" Cut Master is **"really paying off"** at Newport News Shipbuilding & Drydock Company. Here you see it taper boring a large valve. On this job, it also faces the flange and counter bores, as shown on the cross-sectional drawing. The Cut Master **not only** saved 33⅓% on these three operations **but also** provided such a smooth finish that a grinding operation was eliminated.

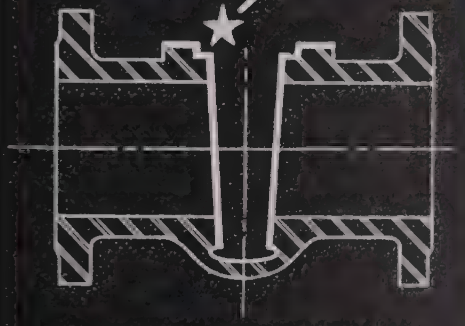
PERFORMANCE REPORT FROM NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

CUTS COSTS 2 WAYS ON CAST STEEL VALVES with a 36" BULLARD Cut Master

1. SAVED 33⅓% ON 3 OPERATIONS

2. ELIMINATED A GRINDING OPERATION





Cross sectional drawing of valve with heavy lines indicating machined surfaces.

BULLARD

You, too, can expect savings on most of your jobs. It's easy to see why: The bed is cast in one heavy, rigid piece. Spindle is firmly supported top and bottom by large Timken roller bearings. Screw feeds provide and maintain a high degree of machining accuracy.

OTHER COST-CUTTING ADVANTAGES

Because the BULLARD Cut Master was designed specifically to save time on and between cuts, you find other unique features. The rapid and positive speed selection with the BULLARD pendant type control, limit-stops for simplified dimensional duplication, and centralized operating controls speed up operations and conserve costs. For complete description of these and other distinctive features, as well as data on feeds, speeds and sizes, write for Bulletin CVTL-4-1 today. THE BULLARD COMPANY, Bridgeport 2, Connecticut.

BULLARD CREATES *NEW METHODS* TO MAKE MACHINES DO MORE

year the vacation allowance will be boosted to $62.20 and $124.40.

Salaried employees at Briggs received a 9 pct pay raise with a minimum of $20 increase.

During the final stages of the Briggs negotiations, the company experienced eight "quickie" strikes. In some cases the workers reported on schedule and then left the plant at an agreed time. In one plant the workers failed to report after lunch. Whether a harassing tactic to force a better agreement or merely a show of strength by the union, the strikes cost an estimated 26,000 man-hr of production and a corresponding loss in income to Briggs workers.

A new Kaiser-Frazer agreement with the union follows the 13¢ pattern and a 9 pct wage increase for salaried employees, with a minimum of $22.50 per month for the latter classification.

Unique in the K-F agreement is the establishment of a Social Security program to be administered jointly by the company and the union. The new Social Security Fund replaces K-F's Security Trust Fund which called for an accumulation of $5 for each car shipped. This agreement is terminated as of May 31. Approximately a half million dollars will be distributed to employees from the fund.

The Security Trust Fund is equivalent to 3.6¢ per hr. Under the new agreement, K-F will pay into the Social Security Fund 5¢ for each hour worked by employees. A board composed of an equal number of representatives of the company and the union will immediately review plans for the establishment of hospitalization, sick and accident benefits, prepaid medical service, life insurance and other forms of Social Security benefits.

The K-F Social Security program is the first to be offered by the automobile industry.

While most of the new contracts eliminate these so-called "fringe" payments from 1949 wage discussions it is anticipated that in 1950 the auto unions will be back with more insistent demands for Social Security than ever before.

* * *

MEETING for the first time in Detroit the Resistance Welding Research Coucil has proposed a well integrated program which, if properly implemented, will eliminate much of the "cut and try" basis for solving automotive welding problems.

Among other things the Welding Research Council is planning to investigate:

(1) The sizes of punches required to form projections in various types of sheet metal for projection welding.

(2) The effect of a "double pressure" or "rising pressure" cycle to improve the quality of projection welds by avoiding premature collapse of the projection.

(3) Methods of insuring sound projection welds.

(In the "rising pressure" procedure, first a light pressure and then a heavy pressure is applied.

In the discussion it was pointed out that projection welding has not been extensively used up to the present time by the automotive industry wherever structural strength is involved. However, high welding speed and ease of handling in production makes the process attractive if these objections can be overcome.

Development of projection welding techniques that would insure a sound weld and prevent collapse of the projection before the weld is completed should also reduce the number of welding operations required in forming an automobile body, it is argued.

DURING the past year the Welding Research Council has spent about $20,000 in its investigations of welding practice. Among the objectives of the proposed research program is the development of data showing the factors that must be evaluated to obtain a good ash weld of steel. The council will shortly publish such a report on aluminum, showing the exact amount of power and speed of welding required for aluminum flash welds in order to obtain optimum weld results. By reference to a series of standard charts it can be determined exactly what temperatures are critical for any popular type of aluminum alloys. If the user of a welding machine has a flash welding job to do, say the welding engineers, he can look at his charts and see whether the machine will do the job—or just how good a job it can be expected to do.

The flash welding project on aluminum has been carried on largely with aircraft parts in mind, but it is anticipated that the investigation will be pressed to obtain identical information on the flash weldnig of steel.

Another investigation under discussion is spot welding of heavier sections. It is the contention of a manufacturer of auto frames that spot welding could compete with arc welding for frame sections on automobiles using ⅛ to 5/32 in. stock if additional technical data were available. Nonautomotive manufacturers, it was pointed out, are already working on spot welding of ¼ to ⅛ in. sections.

Other projects announced by the Welding Council call for the investigation of the effect of various coatings, scale and other surface factors effecting weldability. The investigators will attempt to find out how much control of surface conditions is necessary in order to insure good welds.

In its future research programs it is expected that the Welding Society as well as individual car makers will give greater attention to the design of parts for welding. One automotive welding engineer made the statement that only about 10 pct of auto parts that are resistance welded in the automobile industry today are intelligently designed for welding. It is also expected that research projects of the future will give considerable attention to the possibility of improving the fatigue life of spot welds.

Flat Wage Guarantee Is First To Be Signed In Automobile Industry

Detroit

• • • **Hailed by the UAW-CIO** as the first contract in the automotive industry guaranteeing an annual wage, a contract covering 425 employees of the Metal Mouldings Corp., Detroit, has been signed with Local 174.

The unique agreement guarantees a minimum of 50 weeks work at regular rates of pay to all employees with 10 years seniority or more. According to the union about 25 pct of the company's employees fall in this classification.

The contract also provides for three weeks paid vacation for the ten year group had pay rates 20¢ an hr above regular rates, according to the union announcement.

Other features of the new contract include a provision calling for an immediate 13½¢ an hr increase and 5 day sick leave per year at rates 20¢ an hour above regular pay.

New way to a NEW world!

● In our world of tomorrow that soon will be today, beauty plays a new and leading role. For modern designers have found beauty has in it the essence of utility. Auto-Lite's great Bay Manufacturing Division reflects the importance of this new trend. Here under one roof are the technical skills and production capacity for a new art rendered in plastics including brilliantly colored elastomeric plastics, decorated metals and metal-plastic combinations. The artistic skill of Auto-Lite's Art and Style Division is available on matters of design and development.

THE ELECTRIC AUTO-LITE COMPANY
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plastics and metals

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Washington . . .

EUGENE J. HARDY

• FTC lets capacity charge slide . . . Attorney claims order on price fixing charges will result in expansion . . . Supreme Court expounds on vertical integration.

WASHINGTON—Overlooked in the sharp tussle between the steel industry and the Federal Trade Commission over the industry's basing point method of pricing is the portion of the Commission's complaint charging the industry with collectively acting "to forestall increases in steel production facilities."

With the presentation of FTC's case drawing to a close, attorneys for the Commission told THE IRON AGE that "there are no plans at this time to introduce evidence to support this charge."

Reasons for the decision to pass this charge at this time are many and varied. It will be remembered that the original complaint in the price-fixing charge contained no reference to the alleged failure to expand steelmaking facilities, due to differences of opinion within the Commission on the advisability of including this allegation. The amended complaint, however, contained the charge cited above.

Principally, the decision not to press the capacity charge can be chalked up to a desire to proceed with "first things first." It is fully realized that failure to prove the capacity charge might jeopardize the primary objective of the FTC case—outlawing of the basing point system as practiced in the steel industry.

Lynn C. Paulson, chief trial counsel in the steel case, points out that stimulation to independent action on the part of the steel industry as a result of a cease and desist order similar to that outlined in THE IRON AGE last week (p. 104) will "render unnecessary any specific reference to the capacity charge."

Regarding evidence to support the capacity charge, Commission attorneys state that a limited quantity has been collected, but there is not enough to deem it advisable to pursue the subject.

Another deterring factor is the realization that the charge might be difficult to prove in view of the fact that the industry in the period Jan. 1, 1947—Jan. 1, 1950 will have added about 5 million tons to existing capacity bringing the total to almost 97 million tons.

Then, too, this charge cuts across the work of many other government agencies interested in the capcity gesture from the standpoint of national defense and the effect of steel shortages on employment and general economic well-being.

* * *

THE Supreme Court recently served notice on the Justice Dept. that vertical integration in industry is not illegal per se. In the majority opinion in the Consolidated Steel Case, which was a 5-4 split decision, the so-called conservative element on the court declared that, "it seems clear to us that vertical integration, as such without more, cannot be held violative of the Sherman Act. It is an indefinite term without specific meaning. Even in the iron industry where could a line be drawn—at the end of mining the ore, the production of the pig iron or steel ingots, when the rolling mill operation is completed, fabrication on order or at some stage of manufacture into standard merchandise?

"No answer would be possible and therefore the extent of permissible integration must be governed, as other factors in Sherman Act violations, by the other circumstances of individual cases. Technological advances may easily require a basic industry plant to expand its processes into semifinished or finished goods so as to produce desired arti-

○ ○ ○

THE HARD WAY: Puerto Rico's "TVA" located near San Juan represents a part of the $100 million industrial comeback started in 1942 to provide work for the Island's 2 million population. Like the Pyramid of Cheops in Egypt, most of the work is being done by hand.

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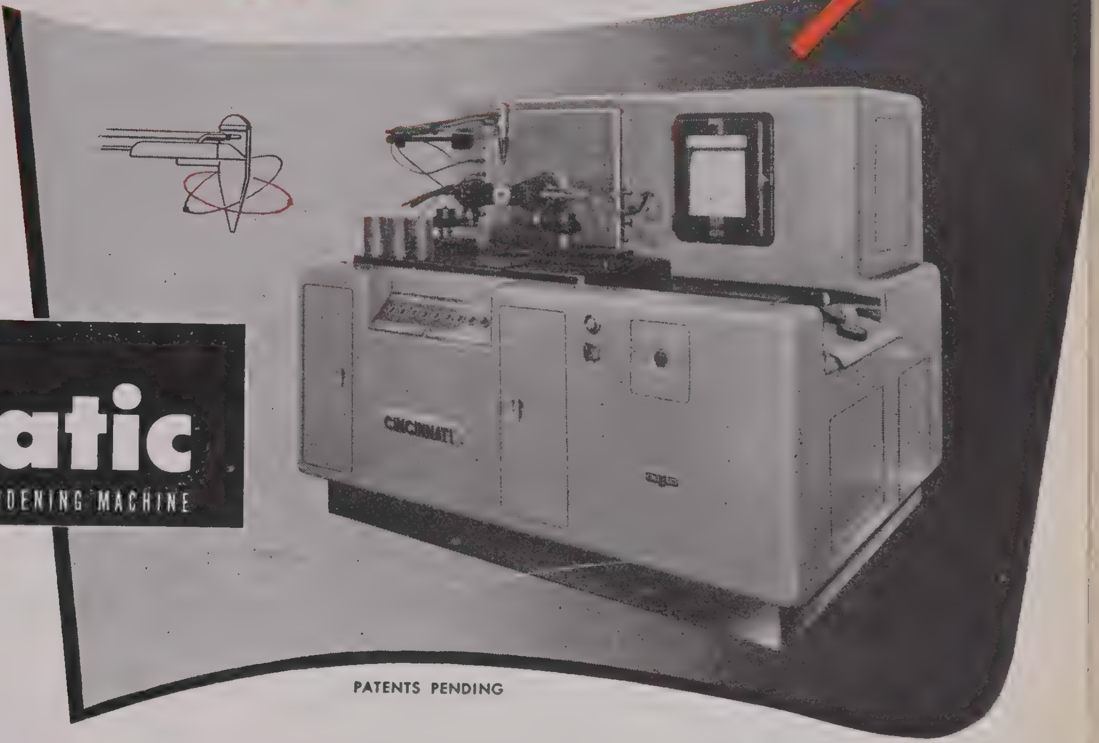

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Electronic temperature control causes parts to quench within plus or minus 5°F. of preset temperature, assuring controlled hardness and hardness gradient, part after part, on long or short runs.

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Heating with high-temperature flames is fast, economical. Heat is confined to surfaces to be hardened; core properties unaffected.

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For a machine that will process parts up to 8 inch diameter with 2 inch face, others with smaller diameters, up to 18 inches long—the Flamatic is definitely low in cost.

WRITE, on your letterhead, for new 20-page factful picture-story of the Flamatic — PUBLICATION M-1611.

THE CINCINNATI MILLING MACHINE CO., CINCINNATI, OHIO, U.S.A cles in greater volume and with less expense."

GOING one step further, the majority declared that "it is not for the courts to determine the course of the nation's economic development. Economists may recommend, the legislative and executive branches may chart legal courses by which the competitive forces of business can seek to reduce costs and increase production so that a higher standard of living may be available to all. The evils and dangers of monopoly and attempts to monopolize that grow out of size and efforts to eliminate others from markets, large and small, have caused Congress and the Executive to regulate commerce and trade in many respects. But no direction has appeared of a public policy that forbids, per se, an expansion of facilities of an existing company to meet the needs of new markets of a community whether that community is nationwide or countrywide."

On the other hand, recognizing the broad antimonopoly powers given to the courts by Congress, the majority points out that "the very broadness of terms such as restraint of trade, substantial competition and purpose to monopolize have placed upon the courts the responsibility to apply the Sherman Act so as to avoid the evils at which Congress aimed. The basic industries, with few exceptions, do not approach in America a cartelized form. If business is to be forbidden from entering different stages of production that order must come from Congress, not the courts."

THE BULL OF THE WOODS BY J. R. WILLIAMS

PUTTIN' ME ON THAT THING, RUN BY GADGETS AN' BUTTONS? WHAT GOOD IS ALL MY KNOWLEDGE OF TH' MACHINIST TRADE -GONNA DO ON THAT SLOT MACHINE?
WHAT GOOD IS ALL YOUR KNOWLEDGE OF BASEBALL DOIN' YOU NOW? YOU COULDN'T MAKE FIRST BASE ON A LOST BALL!
THEY TAKE TO NEW THINGS SLOW--HE HAD A HANDLEBAR MOUSTACHE WHEN HE WAS HAULED OFF THE BALL FIELD!
6-25
J.R.WILLIAMS
THE REBEL YELL
T. M. REG. U. S. PAT. OFF.
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Declares War Surplus Plants Not Frozen By Govt. Security Clause

Chicago

• • • **War surplus plants** are definitely not frozen, according to Joseph A. Burke, deputy director for the Chicago office of real property. A total of 22 industrial plants in the midwest area are available. In explaining the effect of the national security clause in the disposal program, Mr. Burke said, "Some of the WAA properties have been designated by the national munitions board for application of the National Security Clause. Under this clause, the government retains rights in the event of a national emergency to utilize the facilities for production under government contract. In the event such rights are exercised, the government will negotiate with the purchaser or lessee, if qualified, to carry out the contract."

The two classifications of surplus plants, those subject to and those not subject to the National Security Clause, are currently being offered for sale or lease by WAA.

(1) Plants not subject to National Security Clause: General manufacturing plant, former U. S. Naval Storehouse, Rockdale (Joliet), Ill.; general manufacturing plant, former Eddy Paper Co., 200 Sayre St., Rockford, Ill.; General manufacturing plant, former Sundstrand Machine Tool Co., 2400 S. Eleventh St., Rockford, Ill.; general manufacturing plant, former Continental Motors Corp., Kercheval Ave., Detroit; heavy industry plant, former Dow Magnesium Corp., Marysville, Mich.; heavy industry plant, former National Carbon Co., McDougal St., Fostoria, Ohio; general manufacturing plant, former Toledo core plant, Willys-Overland Motors, Inc., Yost St., Toledo; general manufacturing plant, former Commodity Credit Corp., Blooming Prairie, Minn.; general manufacturing plant, former Commodity Credit Corp., New Richland, Minn.; general manufacturing plant, former Commodity Credit Corp., Wells, Minn.; and general manufacturing plant, portion of Vigo Ordnance Works, Terre Haute, Ind.

(2) Plants for sale or lease subject to National Security Clause: Calumet Harbor yards, former Pullman-Standard Car Mfg. Co., 130th St. & Stony Island Ave., Chicago; Shipyard, former Chicago Bridge & Iron Co., Seneca, Ill.; general manufacturing plant, former Commodity Credit Corp., Galesburg, Ill.; heavy industry plant, former Continental Foundry & Machine Co., East Chicago, Ind.; general manufacturing plant, former Continental Aviation & Engineering Co., 76 N. Getty Ave., Muskegon, Mich.; foundry, former Dow Chemical Co., Sidman St., Bay City, Mich.; industrial equipment plant, former Lima Tank Arsenal, Mitcalf St., Lima, Ohio; steel foundry, former Ohio Steel Foundry Co., Lima, Ohio; magnesium plant, former Magnesium Reduction Co., Luckey, Ohio; and general manufacturing plant, former Willys-Overland Motors, Inc., Toledo.

● Each Morris high production machine is designed for the job. The result is more completed parts—in less time—at lower costs.

For example, the 10 station Vertical Hydraulic Automatic machine shown completes four operations—drilling—reaming—chamfering—tapping—on an automobile Oil Pump Housing and turns out a finished piece at each index of the machine. The operator merely loads and unloads the work by means of a hand clamp arrangement which operates the ten hand clamp fixtures.

The machine is equipped with twelve vertical drilling spindles, two vertical reaming spindles, four vertical tap spindles and one horizontal drill spindle all of which operate simultaneously on a work piece as it is indexed from one position to another. Aside from hand clamping all operations are automatic and operator merely presses a button at the start of each cycle.

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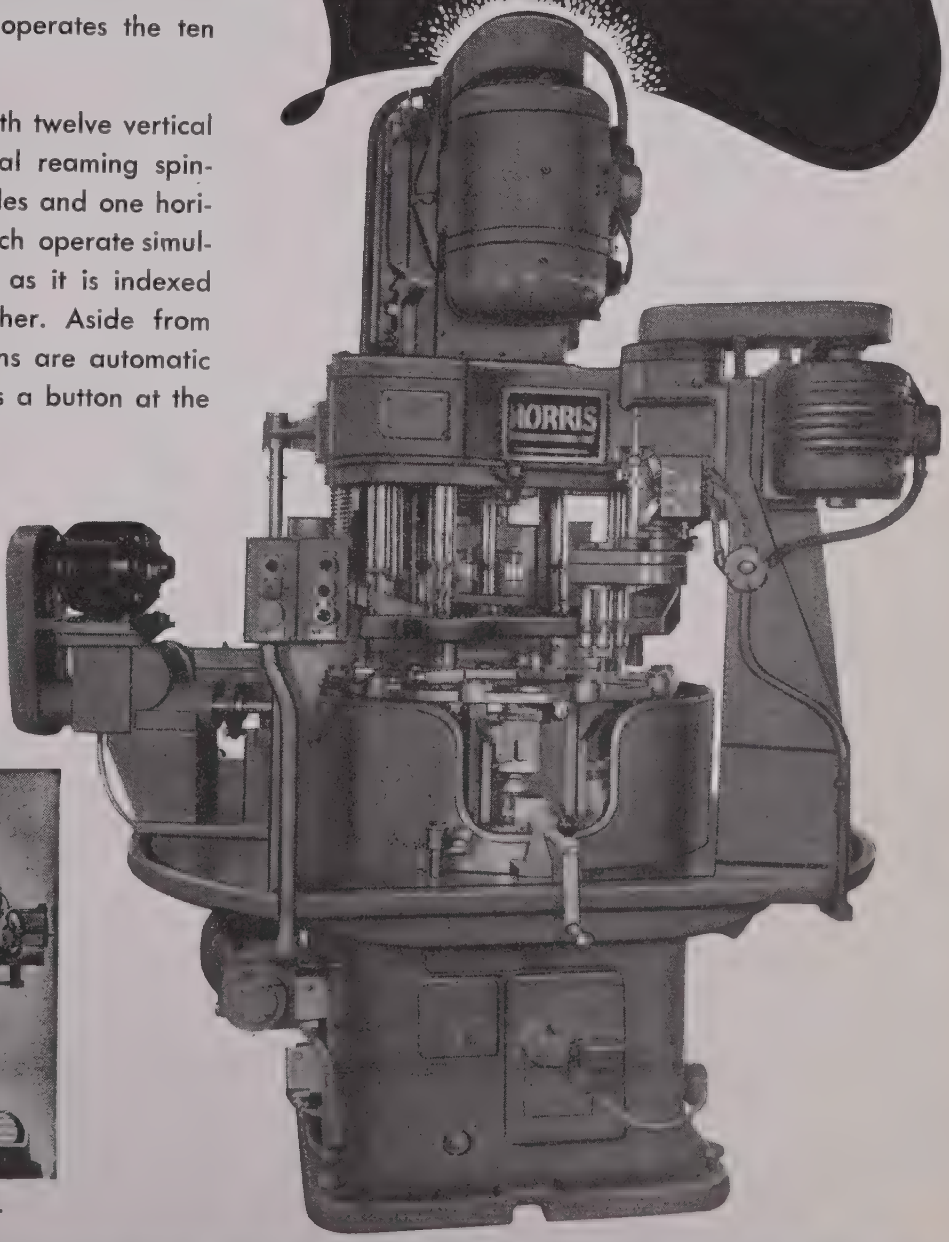

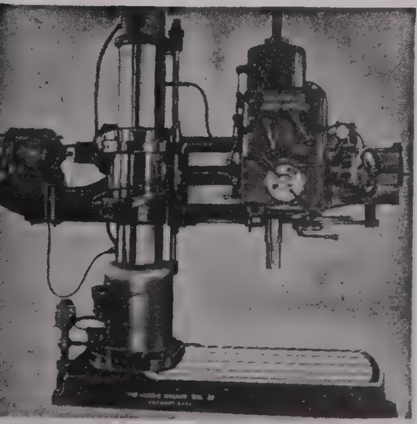

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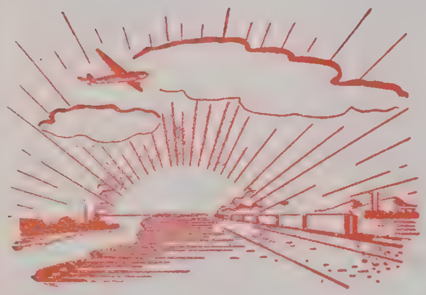
West Coast . . .

ROBERT T. REINHARDT

• Approval by U. S. Supreme Court of Consolidated sale vindicates opinion of most western industrialists who see no chance for reversal . . . Next question is, "Will there now be a change in Columbia's president?"



SAN FRANCISCO—So far as the western steel industry is concerned the announcement that the U. S. Supreme Court had found nothing illegal about the sale of Consolidated Steel Corp. to Columbia Steel Co. is final although it is understood that there is still a possibility of a rehearing which may upset this decision.

The close decision by the Supreme Court came as something of a surprise to most informed observers who were of the opinion that unquestionably the decision would be made as finally announced. These same industrialists are among those who have contended that if the sale was consummated Alden G. Roach, president of Consolidated, would soon become president of Columbia Steel Co. to succeed John Lester Perry who has been filling the post since shortly after the death of William A. Ross in April 1947.

This rumor has been extant for sometime but officials of both companies concerned have refused comment on the grounds that any statement made in this regard might possibly affect the court's actions. Even today no indication from authoritive sources can be secured indicating that such a proposal is contemplated. It is known that Mr. Perry, although doing an excellent job as head of this western subsidiary of U. S. Steel Corp., took the post with the understanding that it was a temporary assignment. Those who know Mr. Roach well are not convinced that he would relinquish his independence to become the titular head of a subsidiary of a large corporation after having been a big frog in a small pond for many years and in the process acquired a substantial fortune.

It is generally conceded that Mr. Roach has many friends in the western steel industry and would be a valuable asset to Columbia in the event he chooses to take the position when it is officially tendered.

Following announcement of the Supreme Court's decision, Mr. Roach as president of Consolidated issued the following statement: "As has been previously stated, as a result of the sale Consolidated will realize a gain of approximately $4 million, net after taxes, over the depreciated book value of the assets to be sold. The company will also retain profits realized on all work performed to the closing data.

"Assuming that the closing will be on Aug. 31, which would coincide with the end of the company's current fiscal year, it is estimated that the net amount which will be available for distribution to shareholders, after all known debts and liabilities have been paid, will be approximately $50 per share. It must be emphasized, however, that this figure represents only an estimate and an approximation, and that it is based upon a number of assumptions, including the assumption that the company's opreations will not be subjected to any unforeseen interruption during the last 4 months of the fiscal year, that anticipated profits will be realized from work to be performed during such 4 months period, that a contingency reserve of $700,000 will prove adequate but not excessive, and that none of the major pipe contracts is cancelled. The amount per share actually available for distribution may prove to be substantially greater or less than such estimated amount.

'The acquisition of Consolidated's facilities by U. S. Steel constitutes a long step toward strengthening and stabilizing the steel fabricating industry in the California, Arizona and East Texas areas. As such, it will tend to assure a more even level of employment in Consolidated's several plants and a continued competitive source of fabricated steel products. For these reasons the sale is regarded as being in the public interest as well as in the interest of Consolidated's 2000 shareholders."

WHOEVER the next president of Columbia Steel Co. is, he will have the responsibility of operating the $25 million cold-reduction mill nearing completion at Pittsburg, Calif. At a recent press conference, Mr. Perry let drop the information that the cold rolling mill is actually turning out sheets on a trial run basis at the rate of about 120 to 140 tons per day. Mr. Perry pointed out that the reduction mills are gradually getting their shakedown but that full production could not be expected until September or October. In the interim the trial run of sheets which pass inspection will be stockpiled until operation gets going on a production basis at which time the annealing furnaces will be lighted and the cold-rolled sheets made ready for distribution. Some of the decoiling machinery and shears are at work on hot-rolled coils, shipped in from Birmingham, for distribution to a few customers who can use that grade of product.

Unofficially it is understood that a large part of the production at Pittsburgh will be funneled into tinplate because of the dire need for this material to handle the high level of agricultural production.

Although the flow of raw materials and component parts has somewhat delayed production of the 1949 Ford at the Richmond, Calif. plant of the company, approximately 130 passengers cars and 71 trucks per day are being produced, according to W. A. Abbott, plant manager, who conducted the press through the plant recently to introduce the new model

First there were 2 Bliss Cluster Mills
NOW THERE ARE 10

Small Bliss Cluster Mills, reversing and one-way, have proved their year-in, year-out efficiency in cold reducing narrow high-carbon and stainless steel. That's why one company has added a new battery of eight Bliss mills to the two originally installed.

Here are some of the operating features that make these rolling mills so practical:

Mills are easy to install, being mounted on one-piece base. Rolls are easy to change. Maintenance is low.

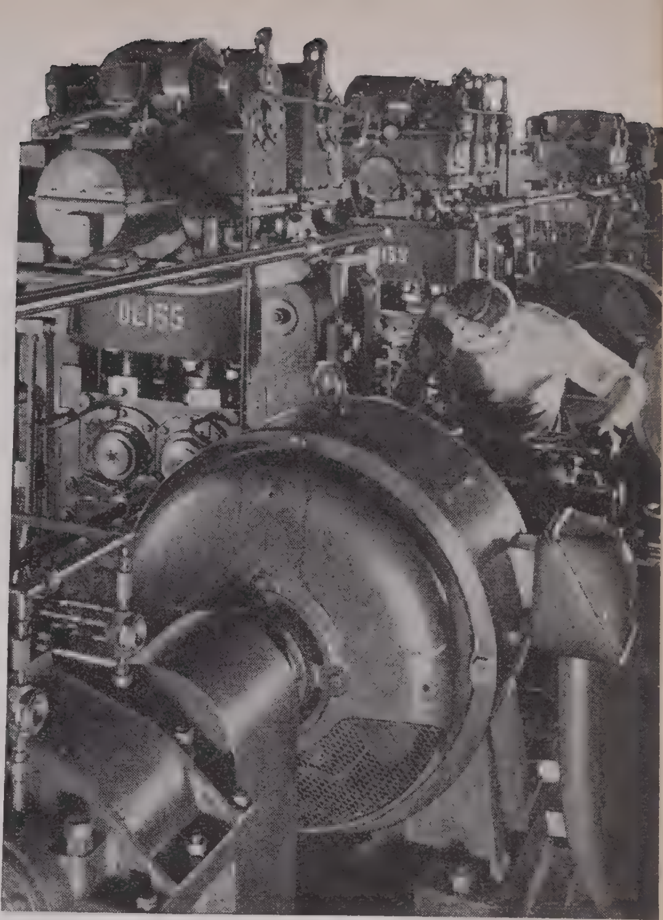
Motor control of screw-down gives better control of gage. Stalled tension is maintained when necessary.

Lubrication is automatic... mill stops if oil or grease pressure fails.

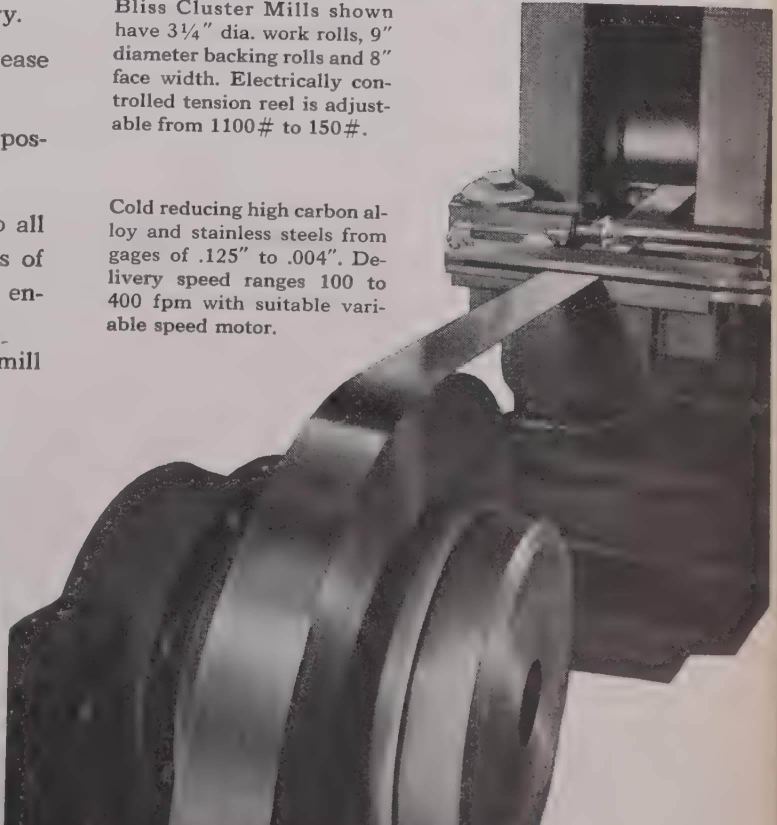
Moving parts are completely enclosed wherever possible for safety.

These sum up to the kind of skill that's built into all Bliss equipment... the related know-how that comes of merging ninety years of experience into rolling mill engineering and construction.

It may be just what you need to solve your rolling mill problem. Talk it over with a Bliss Sales Engineer.

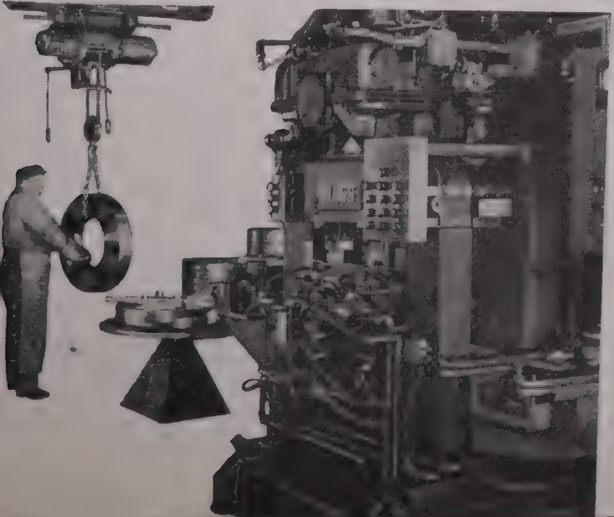


Bliss Cluster Mills shown have 3¼" dia. work rolls, 9" diameter backing rolls and 8" face width. Electrically controlled tension reel is adjustable from 1100# to 150#.



Cold reducing high carbon alloy and stainless steels from gages of .125" to .004". Delivery speed ranges 100 to 400 fpm with suitable variable speed motor.

Quick loading and reloading of coils keep Bliss mills producing with little interruption. Operator is readying new reel as stock in mill nears end of finish-rolling.



E. W. BLISS COMPANY, DETROIT 2, MICHIGAN

Manufacturers of two-, three-, and four-high mills for hot and cold rolling; single stand, reversing, or tandem mills for ferrous or nonferrous metals. Accessory mill equipment furnished complete.

At peak production Richmond is expected to produce approximately 400 trucks and passenger cars of all Ford models per day and the Long Beach, Calif. plant of Ford is now producing approximately 40 cars per day with an estimated ultimate capacity of 300 to 350 units.

Expansion of the Richmond facilities is expected this fall in the form of a new warehouse to handle service parts which are now housed in the assembly plant and handicap efficient operation. Approximately 90,000 sq ft is devoted to this use in the present plant and the new warehouse will have almost double that space. A site has been selected on the property owned by the Santa Fe Railway in the old Richmond shipyard which is still subject to approval from the eastern office. Ford Motor Co. now has plants at Richmond and Long Beach, for Ford assembly, and a plant at Maywood, Calif. for the assembly of Lincoln and Mercury cars. The company also maintains sales and parts depots at Seattle, Salt Lake City and Denver.

The new Ford is scheduled for display to western dealers June 18th (for description of the new Ford see THE IRON AGE, June 10, 1948, p. 100).

LOS ANGELES—General Metals Corp. is now in the process of erecting a mechanical malleable iron foundry whose production will be between 400 and 500 tons of castings per month. The million dollar expansion program is expected to be completed in September 1949 on a 4 acre site adjacent to the company's present facilities in the Vernon district, according to William A. De Ridder, president.

The melting system used by General Metals will be the duplexing process using cupola furnaces and one oil fired air furnace for the refinement of the metal. The foundry molds will be carried on the pouring train to the source of hot metal at the air furnace. The molding will have overhead sand handling equipment and spill troughs under each molder to insure high production on the molding floor and sanitary working conditions according to F. L. Stamm, chief engineer.

After molding and pouring, the castings will be shaken out automatically under an exhaust hood to keep fumes from the workman. They will then be transferred by the conveyer through a Ransohoff barrel and on to a sorting conveyer. The castings will then be carried to the annealing room where a battery of General Electric elevated type electric fired annealing furnaces will complete the work in 48 hr instead of the usual 5 to 7 days. After annealing, they will be shot blasted and straightened prior to shipping.

A large part of the new plant's production is expected to go into the local market for automobile parts which is reported to amount to as much as $150 million per year.

Prime metal manufacturing and fabrication led all other fields of industrial activity in Los Angeles County last year in announced or actual capital investments for new or enlarged plants, a Los Angeles Chamber of Commerce survey reveals.

Columbia Steel Co.'s planned cold-reduction mill to cost more than $30 million was responsible for the bulk of the $39,675,500 metal development contemplated or executed. Investments in new plants were $32,150,000 while expansions were reported at $7,525,000.

Among new industries established last year were; cans, castings, dies and tools, grinding, iron and steel products, patterns and models, polishing, screw machine products, spinning, stamping, tubing and welding.

EMPLOYMENT levels are lower in nonferrous production, particularly in secondary smelters and foundries, where materials stocks are low and recovery will be impeded by possible work stoppages. Metal fabricating plants are also reporting decreased employment and production, but machine shops are beginning to tool-up and expect more activity in the near future, according to the May report of the California Dept. of Employment.

First bright and black annealed wire will be produced at the new mill of Bethlehem Pacific Coast Steel Corp. at Vernon, near here, within the next 2 months. Construction of the $2 million plant has been underway since December 1947.

* * *

Downey, Calif.—North American Aviation has leased the complete aircraft plant facilities of Consolidated Vultee Aircraft Corp. here to start buildup for production of a new type airplane. Operations at the Downey plant will require approximately 2500 people by late this year, J. L. Atwood, president of North American, reports.

North American Aviation's operations will continue as usual at the Los Angeles plant, where production is starting on the Air Force F-86, and at the Long Beach plant, which is in production on the Air Force's only operational four-jet bomber, the B-45. Production of a new Air Force trainer, the North American T-28, also will be located in the Los Angeles plant.

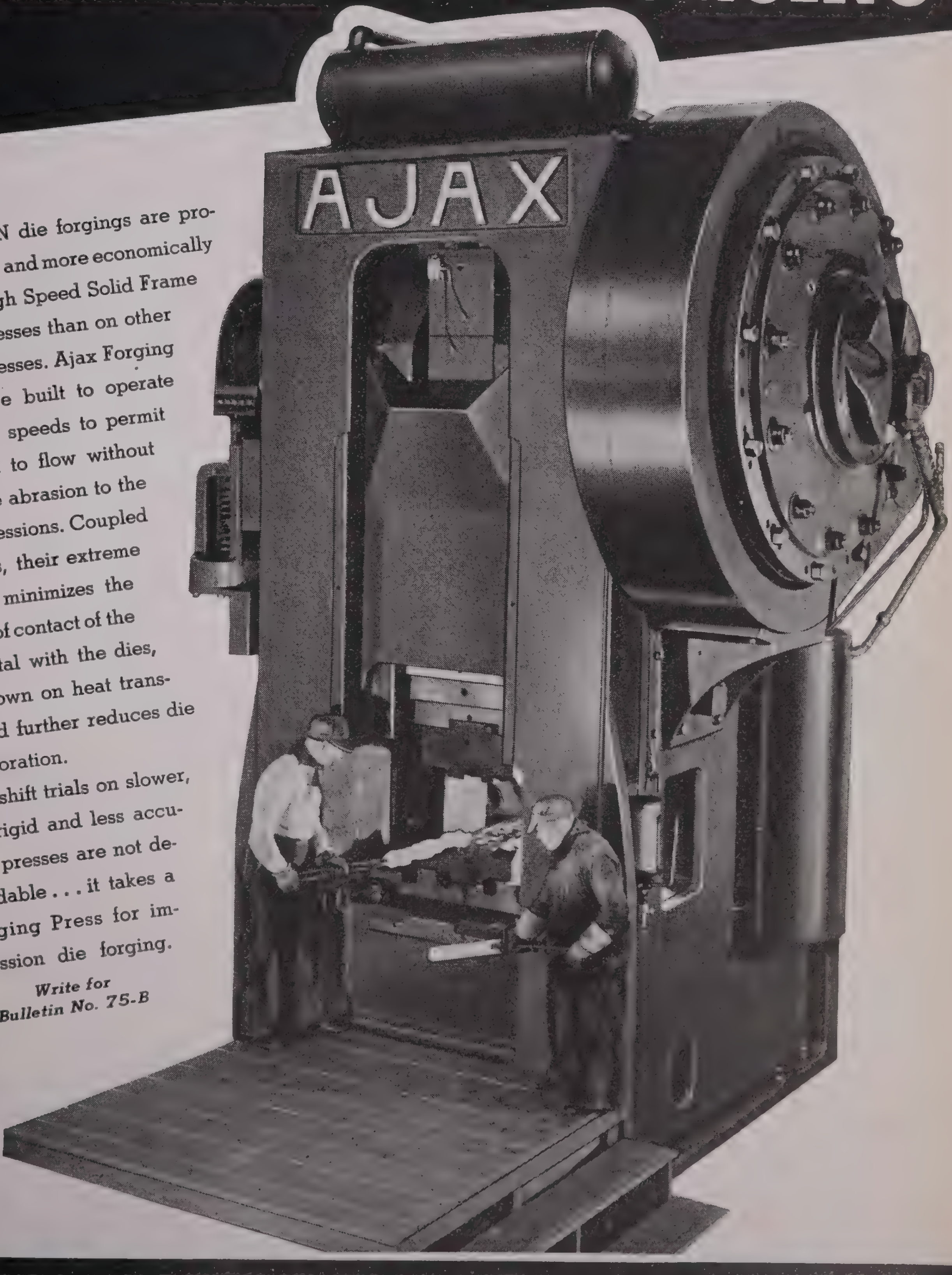
SALT LAKE CITY—The U. S. Supreme Court's approval of the sale of Consolidated Steel to Columbia strengthens the position of the Geneva steel plant, in the opinion of Walter Mathesius, president of Geneva Steel Co.

Acquisition of Consolidated by U. S. Steel's West Coast subsidiary, he said, tends to insure large scale production by the Utah subsidiary. Moreover it will give Geneva a balanced production—hot-rolled coils for Columbia's Pittsburg, Calif plants and plates and structural shapes for the Consolidated plant.

Had the Consolidated sale been blocked by the court decision, he pointed out, U. S. Steel might have been forced to build duplicating fabricating facilities to get an outlet for Geneva's plate and structural steel production.

The going is getting progressively rougher and tougher for the International Union of Mine, Mill and Smelter Workers union in this area. Ten local unions have now pulled out of the International because of the refusal of top officials to sign non-Communist affidavits and more are reportedly getting ready to sever the ties. Several influential local union leaders, who until recently were denouncing secession, are now blasting the International and its officers for Communist party line policies. Operators are encouraging the revolt by refusing to negotiate with the International until the officers sign the affidavits.

Seven of the seceded locals have affiliated with CIO through the Marine & Shipbuilders union.



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PERSONALS

* * *

• **Arthur J. Wieland,** executive vice-president of Willys-Overland Motors, has been elected chairman of the board of directors of the Wilson Foundry & Machine Co., Pontiac, Mich., succeeding the late **Hiram J. Leonard.**

• **A. B. Muskett** has been appointed vice-president in charge of manufacturing, General Electric X-Ray Corp., Milwaukee. Prior to his advancement he held the post of manager of manufacturing. **R. R. Roberts** has been named administrative assistant to the executive vice-president. Mr. Roberts formerly served as traveling auditor and financial assistant in the affiliated manufacturing companies department of General Electric. **Adolph Rebensburg** has been appointed administrative assistant to the marketing manager of GE X-Ray. Mr. Rebensburg prior to his appointment has been manager of marketing serearch for GE International. **E. Dale Trout** has been appointed technical assistant to the marketing manager, GE X-Ray. Mr. Trout was formerly director of technical services.

• **Herman H. Pancake** has been appointed manager of the American Car & Foundry Co.'s newly-created mine car and special products sales division, a consolidation of the mine car sales and miscellaneous sales divisions. Mr. Pancake has been manager of mine car sales since 1945. His increased jurisdiction comes upon the retirement of **H. D. Distelhurst,** formerly manager of the miscellaneous sales division, after 43 years of service with ACF.

• **Barney N. Dagan** has been named superintendent of the openhearth department, Iron & Steel Div., of the Kaiser steel plant in Fontana, Calif. Mr. Dagan joined Kaiser Co., Inc., in 1946 and was formerly connected with the Youngstown Sheet & Tube Co. **William F. Bowers, Jr.** succeeds Mr. Dagan as assistant openhearth superintendent. Mr. Bowers joined the Fontana plant in 1947 and was formerly connected with Carnegie-Illinois Steel Corp.

• **F. P. Hutchison** has been elected president of Harrington & King Perforating Co., Chicago. Mr. Hutchison succeeds **J. M. Fuller** who has retired after 62 years with the company. **Judson E. Fuller** has been named vice-president and treasurer and **S. Harrington, Jr.** has been elected secretary.

EARL A. GARBER, president, Harbison-Walker Refractories Co. and its subsidiaries, Northwest Magnesite Co. and Louthan Mfg. Co.

• **Earl A. Garber** has been elected president of Harbison-Walker Refractories Co., Pittsburgh, and its subsidiaries, Northwest Magnesite and Louthan Mfg. Cos., succeeding **Raymond Willey,** who has retired after 46 years of service. Mr. Garber joined Harbison-Walker in 1915 and in 1947 was elected vice-president and general manager of these companies.

• **R. F. Miller** has been appointed assistant to vice-president, research and technology department, Carnegie-Illinois Steel Corp., Pittsburgh. Dr. Miller began his service with U. S. Steel at the Kearny, N. J., laboratories in 1936. He came to Pittsburgh in 1943 as development engineer in stainless and alloy steels for the department of research and technology, the position he held at the time of his present appointment. **Robert B. Parker,** assistant to manager of sales, New York district sales office of Carnegie-Illinois, has been named manager of sales, Washington special accounts office, succeeding **L. R. Knapp,** who has retired. Mr. Parker came to the sales department of Carnegie-Illinois in 1940.

• **Louis C. Breetz** has retired from Youngstown Sheet & Tube Co. after 46 years of service. Mr. Breetz joined the company in 1902 and in 1923 was made assistant superintendent of maintenance, electrical, at the Brier Hill Works, a post he held until his retirement.

• **J. W. Robinson** has been named manager of sales, hot-rolled products, Jones & Laughlin Steel Corp., Pittsburgh. The hot-rolled bar sales department formerly managed by Mr. Robinson, has been discontinued and its functions absorbed in the hot-rolled sales department. **A. A. Wagner,** formerly manager of sales, hot-rolled products, has been appointed special assistant to the vice-president of sales and assigned to duties in Washington.

• **Raymond H. Schaefer** has been appointed director of research and development, American Brake Shoe Co., New York. Mr. Schaefer joined the company in 1940 and since 1945 has been chief metallurgist in charge of metallurgical research and the experimental foundry.

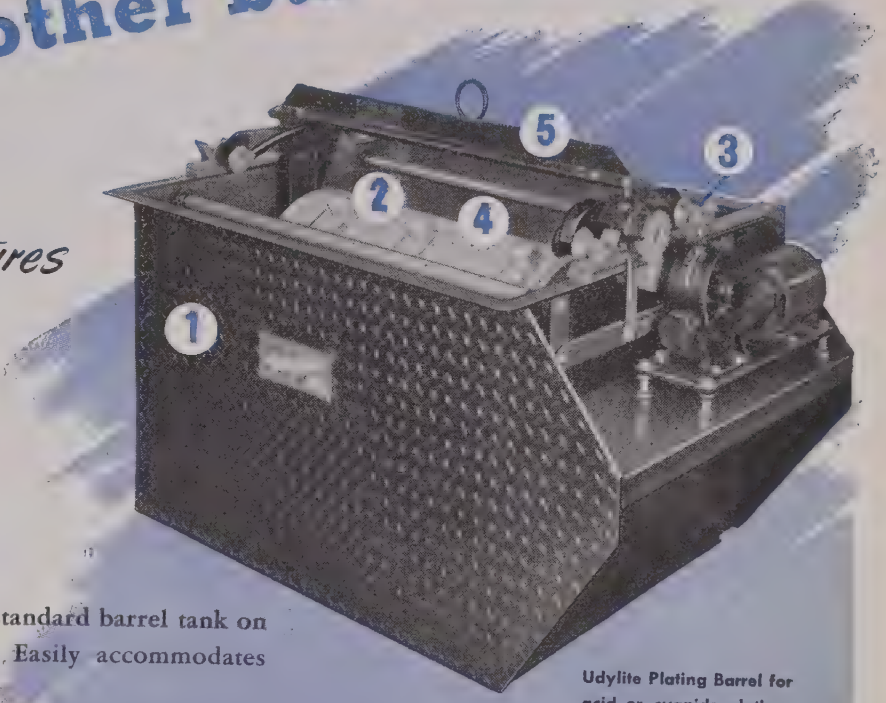
• **Harvey M. Snook,** assistant supervisor, cost and statistics division, Tennessee Coal, Iron & R.R. Co., Birmingham, has been named assistant comptroller in charge of the division. Mr. Snook succeeds **Joseph B. Copper** who has been transferred to the U. S. Steel Corp. of Delaware at Pittsburgh, where he will serve as division chief industrial engineer, basic standards. **James W. Porter,** supervisor of special sales and cost analysis section, becomes assistant supervisor, cost and statistic division of the Tennessee company.

• **Roger W. Rodgers** has been appointed sales manager of the sheet metal specialty division, Follansbee Steel Corp., Pittsburgh. Mr. Rodgers was formerly sales manager in the Chicago area and merchandise manager for various fabricated products of Woodall Industries, Inc.

• **E. H. Mollman** has joined the sales and service staff of the Return Bend Div. of the Ohio Steel Foundry Co., Lima, Ohio, with his headquarters in Springfield. Mr. Mollman was formerly with the Key Co. of East St. Louis for 20 years as chief engineer, sales representative, vice-president and works manager.

(CONTINUED ON PAGE 150)

Compare this Barrel with any other built!



Udylite Plating Barrel for acid or cyanide plating.

✓ *Check these features that spell...*

- ★ LOWER MAINTENANCE COST
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- ★ FINEST FINISHES
- ★ REDUCED PLATING COSTS!

. Big, double-welded tank (largest standard barrel tank on he market). Leak-proof construction. Easily accommodates eating or cooling coils.

2. "Deep-Dip" Plating Cylinder. Hangs deeply in the tank to ubmerge completely inside of barrel, for greater current apacity and *faster* plating.

. Heavy contact saddles, of cast brass, machined for perfect ontact with cathode horns. Self-locking device prevents arrel rocking.

. Rigid rails, reinforced by ¾" steel stay bolts running length cylinder.

. Large, steel bridge member holds cylinder in rigid ignment.

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Udylite
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NAME WHAT YOU NEED . . . UDYLITE HAS IT!

• In addition to the sturdiest, most efficient plating barrels ever built (for both acid and cyanide), Udylite offers a complete line of Fully Automatic and Semi-Automatic Plating Machines, tested laboratory supplies, and *complete service*, from no-cost testing of your solutions to design of entire plating plants. Call in a Udylite Technical Man on *any* plating problem!

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"PIONEER OF A BETTER WAY IN PLATING"

European Letter . .

- **Six Power Agreement does not find Russian Zone in Germany unprepared for counter measures . . . Communists drain reparations from Russian Zone but fail to replenish with sufficient raw materials.**

LONDON—Publication of the Six Power Agreement on what is to be done next in Western Germany does not find the Russian Zone unready to take its counter measures. On the contrary, ever since the last attempt of the foreign ministers to agree on their German policy broke down in December, the Russian occupation authorities and their German agents in the dominant Socialist Unity Party (SED) have been hurrying on political, economic and administrative preparations for the new situation. They could probably establish an eastern government in Berlin tomorrow, not on an elected basis, but with effective powers over the economic and administrative machine of the Zone, and the government would be virtually under Communist control. It would have the threefold task, self-contradictory to any but Communists, of satisfying all Russian demands for reparations, tightening the grip of popular democracy on the 18 million Germans in the Zone (20 million when the Russian sector of Berlin is incorporated), and at the same time competing with democratic, nationalist and anti-Western slogans for the favor and loyalty of 45 million Germans in the Western Zones.

There is little doubt that the Eastern Germans would be equal to the triple requirements. They have had time and opportunity to practice in all three directions; and behind the practice has always been the idea that if there should be allied agreement to keep Germany United, then the organization built by the SED in and around Berlin would be ready to embrace, split and finally digest the parties and politicians of the West.

THE signal for the present Communist drive to gain the leadership of nationalist forces in Germany was given by Mr. Molotov during the London conference last December. It was then that the people's congress for unity and a just peace, drummed up in the Russian Zone, came into prominence. At its second meeting in Berlin in March the Congress boasted 1117 delegates from the Russian Zone, with only 512 from the three Western Zones, none of them authorized delegates of the leading Western parties. Its leading figures, Pieck and Grotewohl, made it clear that everything possible would be done by threat and argument to dissuade the Western Powers from pursuing their plans for the organization of a West German State, and to frighten western Germans from cooperating (collaborating) with the Americans, British and French.

THE People's Congress elected in March a People's Council of 400 members, on top of which was appointed a President, which has some of the appearance of a shadow cabinet. Of the 29 members of this Presidium, 20 were elected from the Russian Zone and Berlin, while nine members for the three Western Zones were nominated *in camera*. This Council has since appointed a number of committees, of which the most significant seem to be the constitution committee, preparing a constitution for a united Germany, and the peace treaty committee, preparing a draft peace treaty.

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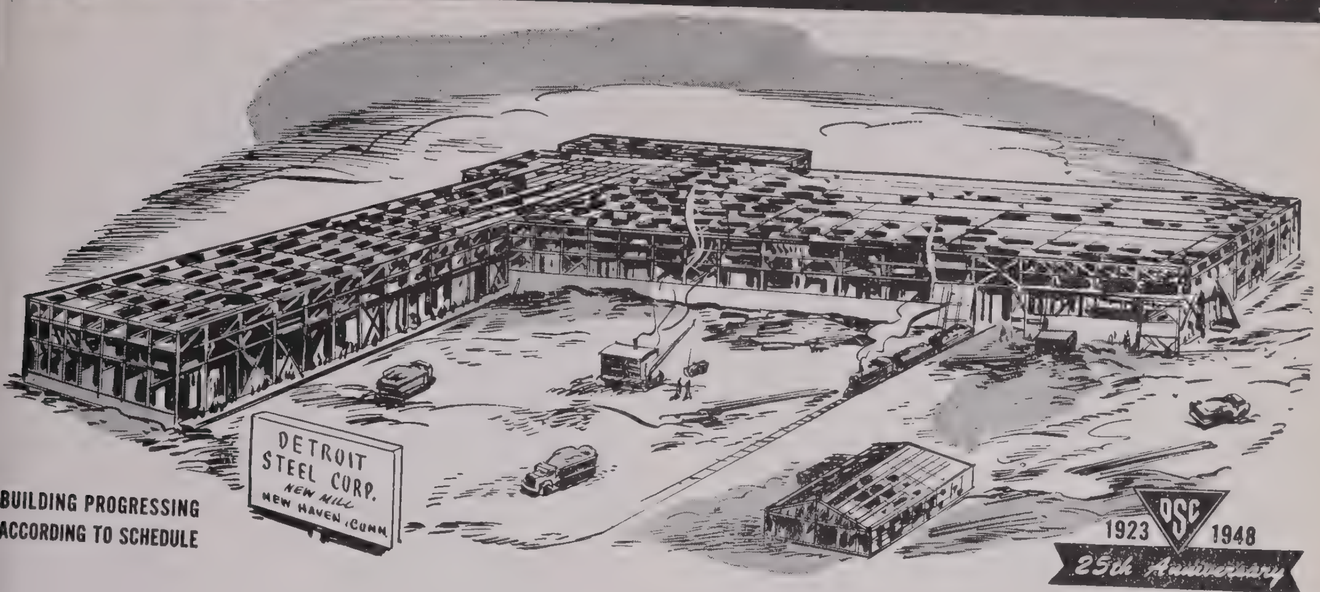
When the People's Council met recently, on the aniversary of the 1848 revolution, speeches were made which virtually asserted the Council's right to represent the interests of the whole German people. In the two bodies are all the makings of a puppet government, without a broad elective basis. And it was just after this meeting that one of the Council's chairmen, Grotewohl, made to the constitution committee the back-handed statement that national resistance would come into play if a Western State were created in violation of Allied agreements.

Parallel with the development of the nationalist movement has come a series of gestures by the Russian occupation authorities, calculated to impress Germans outside as well as within the Eastern Zone. Occupation costs for this year are being lowered, although reparations remain unchanged. On May Day it was announced that Marshal Sokolovsky had promised 20,000 tons of bread grain and 20,000 tons of fodder grain to cover the zonal food deficit until the harvest. The fact that this is a loan to be repaid by German industrial production received less notice than the fact that something was at last being done to meet the serious food shortage, in which Russian requisitioning has been a contributory factor.

EVEN more significant in its implications for the future is the zonal economic machinery which has been established in recent months. An overhaul of the previously existing machinery by the Russians produced the following results: At the top, with authority over the States, an Economic Commission with 16 main administrative sections. Decisions of the plenary session of this body are known as decrees; decisions of its secretariat are known as directives. Directive and decree are equally binding on the whole Zone. Its power lies in its authority to direct the distribution of goods and materials within the Zone; its attention is specially directed to the control of industrial production, in which the Russians are chiefly interested, for the key plants are owned by the Russian State through the Soviet AGs. It is from industry that come the reparation goods which find their way into world markets and earn dollars for Moscow.

MORE STEEL COMING FOR DSC CUSTOMERS



BUILDING PROGRESSING
ACCORDING TO SCHEDULE

Here's How We're Going to Have More Steel for You . . . .

Dependable Dan Our Customers' Man Invites Correspondence Regarding Your Normal and Regular Requirements

Frankly, we may be unable to accept new business now, but looking ahead, we would like to keep you informed about our expanding facilities.

Now under construction . . . a big, new cold rolled strip mill in New Haven, Conn., scheduled to begin rolling by October 1, 1948 . . . to give Eastern customers 60,000 tons additional producing capacity . . . practically at their stockroom doors.

Improvements at our Detroit Mill to step up that unit's producing capacity to 150,000 tons a year . . . to increase the supply of cold rolled strip available to Midwestern customers by about 35,000 tons a year.

And D.S.C. Reminds You . . . .

That our Detroit mill . . . our Reliance Division network and our Craine-Schrage Steel Division will continue to do everything possible to keep your production rolling . . giving every account equitable consideration . . . constantly planning and working toward greater production and supply . . . and towards higher standards of steel service.

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General Office: 1025 South Oakwood Ave., Detroit 25, Mich.
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Products: SHEETS—Hot Rolled . . . Hot Rolled Pickled . . . Cold Rolled . . . Long Terne . . . Galvanized; PLATES; COLD ROLLED STRIP STEEL—Coils and Cut Lengths . . . Slit or Round Edge . . . All Tempers.

★ ★

CRAINE-SCHRAGE STEEL DIVISION

DISTRIBUTORS AND DIRECT MILL REPRESENTATIVES

Warehouse and General Office: 8701 Epworth Blvd., Detroit 4, Mich.
Sales Offices: Grand Rapids, Toledo, Indianapolis
Products: Cold Drawn and Hot Rolled Carbon and Alloy Steel Bars . . . Tool Steels . . . Drill Rod . . . Wire Rope, etc.

Industrial News Summary...

- ***New Coal Crisis Worries Steel***
- ***Industry Again in the Middle***
- ***Scrap Market By No Means Weak***

IF any steel company has managed to build up a little coal stock in recent weeks, the miners' vacation will take care of that. Then if the government has to go through the by-now-routine action of issuing an injunction against the United Mine Workers a little more coal mining may be lost. But what really gives steelmen the jitters is the hot seat they must occupy until the whole coal controversy is settled once and for all with a new contract.

There was no indication this week that the coal impasse would be settled soon—either way. It may also be that the resentment of the coal miners will be stored up and will blow its top when the 80-day injunction wears out—if no settlement is made by that time. All this means that steel output is under an overhanging cloud that may turn into bad news at any time.

In view of the third round of wage increases in other industries, it looks like John L. Lewis again has the coal operators and the steel industry over a barrel—because what the operators agree on will have to be what "captive" mines also agree on. If King-Coal-John wins his argument, the next domino to fall may be the barricade against the steelworkers built a few months ago when prices were cut and wage increases refused.

THERE is everything in the industrial picture this week that indicates that once again the crazy swirl of wage and price increases is on its way—with the day of reckoning also guaranteed to be a whooper when it comes. It may not be long before the cry of a fourth round will be heard. But there has to be an end—sometime.

For some reason the steel industry has been unable to get across to its public and its consumers (1) it is the fall guy in coal negotiations, because a shutdown of steel mills gives the mine workers the power they need, (2) the loss of steel because of strikes has cut deeply into steel output and repair and maintenance costs, and (3) at no time has the industry done anything but burst a blood vessel to turn out as much steel as possible. If the wage-price cycle and the routine coal impasse continue much longer, the frustration among steel officials may be too much for even their rugged constitutions.

The reception steel leaders gave to the proposed Federal Trade Commission cease and desist order published last week by THE IRON AGE was chilly. Many saw what they had feared. Others claimed to be confused by the review of the proposed order. Still others believed that it was a trial balloon to get their reaction—which it wasn't.

The general opinion was that steel leaders are still unalterably opposed to a change in the basing point method of selling steel. They do concede that phantom freight—charges not actually incurred—may, and probably should, go out the window. But the main complaint was that they believed that sooner or later the FTC would rule absorption of freight illegal—a point not mentioned in the proposed order—unless it was on an individual basis. This, say steel sales people, is a physical impossibility, or at least would make absorbing freight so difficult that most steel firms would sell in their own backyard.

STILL other steel producers were hard-set against the assumption that an f.o.b. mill system would help those customers far removed from the steel centers. Why sell a man 500 miles away when that man in normal times would go somewhere else, they say. Why not sell your closer neighbor and fight it out with competition there. What was not mentioned were the high steelmaking costs which in the future will make it too tough to absorb as much freight per ton as before the war. All in all, it will be a bitter fight next year when the FTC tries once again to make the industry bow to reasoning which the Commission has been trying to put across for years.

Still to be heard from are steel consumers. Many of them feel that they have been the so-called beneficiary of the arguments of steel and the FTC—but have been consulted by neither. They have strong ideas on the basing point system. Many are studying their sales, their sources of supply and their prices, to see where they would stand if an f.o.b. mill system were to appear.

But one thing is still certain this week—steel consumers want steel more than they want to argue about basing points or anything else. They are not going to get what they want this year. It may be that because of the coal crisis—again—they will, by the end of this year, get less than they think, based on recent cuts in third quarter quotas.

The steel operating rate last week was revised to 96.0 pct of capacity. This week it is estimated to be at 96.5 pct. The industry, because of scrap and production troubles, just can't get the rate up to 97.5 or 98. And it may not be able to hold at present level while vacations are being taken in the mills.

The scrap market this week is by no means weak. Buyers are having a tough time getting supplies at current quotations. Almost every pressure possible is being used to keep the price level unchanged. So much so that some steel consumers are not looking very closely at their scrap. Overgrading has popped up in some districts and consumers are not always getting the grade they are paying for—and it isn't the fault of the scrap dealer or broker.

• **HOW LONG?**—An unanswered question is on the lips of a great many steel consumers—How long will the steel producers continue to hold the line on the price cuts they put into effect when they turned down the steelworkers request for a third round wage increase? Many of the consumers asking this question have helped isolate steel's position by granting third round wage increases, raising prices of their products or both. That steel prices and wages will both go up before they go down, is a foregone conclusion in the minds of many who buy steel (when is the only question in their minds). This has been cited by some as an explanation of recent tightening of steel products—and considerably extended deliveries. Meanwhile, steel producers, who refused higher wages and cut prices, do not savor the persistent crumbling of the third round wage-price barrier.

• **APPEAL DENIED**—On June 14 the U. S. Seventh Circuit Court of Appeal in Chicago denied the petition of the rigid conduit industry for rehearing the basing point case. The court had ruled, on May 27, that this method of pricing steel conduit was illegal and had ordered the industry to cease and desist from such practices.

• **ALCOA STRIKE**—Early this week a strike of 18,500 United Steelworkers of America in nine plants of the Aluminum Co. of America was postponed one week, until June 27. The union asked a 13¢ an hr wage boost and a program to "adjust wage inequities." This would be similar to what the War Labor Board ordered in the steel industry. Steel companies paid out millions on that because it was retroactive. An Alcoa spokesman declared that at the same time the War Labor Board ordered the inequity action in steel, it denied a union plea that the same order be directed against Alcoa.

• **FREIGHT CARS**—Commerce Secretary Charles Sawyer brought out the seriousness of the freight car shortage in bold relief last week when he said "We are now allocating steel to build 10,000 cars a month. Actually, we are not even meeting this goal, and 10,000 cars a month falls far short of the need. Today we have on hand some 1,740,000 cars, about a fourth less than in 1930 . . . the strain of current operations is well nigh intolerable. The number of cars scrapped has increased in each month of 1948, and the excess of cars going to the repair shops over those repaired has also increased each month of this year." Meanwhile, a ray of hope was seen in indications that builders might be able to equal their 10,000-car goal for the first time in June.

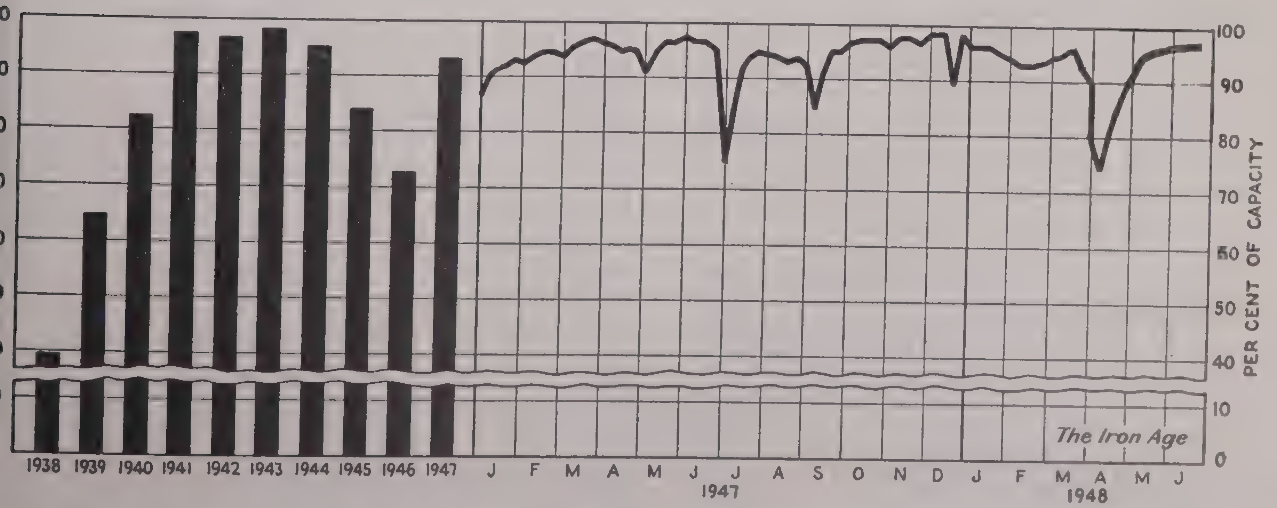
• **NEW STEEL CO.**—Several former officers of Empire Steel Corp., headed by Joseph B. Montgomery, Jr., president, Mansfield, Ohio, and Samuel E. Magid, N. Y., as board chairman, have formed the Penn-Ohio Steel Corp. They have leased a U. S. Navy industrial reserve plant at Birdsboro, Pa. It is understood that the new firm has taken a 5-year lease on the plant which includes two 50-ton basic openhearth furnaces. Production of ingots is slated for mid July. Output will be upward of 6,000 tons monthly. Other officials of the new company include William Lake, vice president production; Roy I. Mitchell, vice president-controller, both formerly with Empire. Also J. G. Baker, formerly with Colorado Fuel & Iron Corp. who will be chairman of the executive committee. Negotiations are underway for adding steel producing and finishing capacity.

• **ENIGMA**—Following exclusive presentation in THE IRON AGE (June 17, p. 123), of the basing point order that would vitally affect steel marketing, reactions of key steel executives were sought by THE IRON AGE district editors. Steel executives read the order, looked up and said, "But this doesn't tell us how we can arrive at prices to meet competition?" They said it in different ways, some angry, some amazed. Sections of the proposed order came in for controversial interpretations (see p. 119). But this phase—or the lack of it—remains steel enigma No. 1.

• **GE RAISES PRICES**—General Electric Co. last week increased list prices of a number of household appliances and two industrial equipment items from 5 to 12 pct. Charles E. Wilson, president, declared the action was necessitated by substantially higher labor costs resulting from recent wage increases granted by the company, along with increased freight rates and higher material and part costs. Mr. Wilson's breakdown of increased costs included $50 million directly in labor costs and $22 million in freight and materials charges on an annual basis.

• **CANADIAN INCREASES**—Canadian steel prices have been increased $5 to $12 per ton. Carbon plates are up $12 per ton; skelp, $12 per ton; hot rolled bars $5 per ton; wire rods, $5 per ton; while hot and cold rolled sheets were hiked $7 per ton. This makes new prices for plates $74 per ton; bars $70 per ton; wire rod $65 per ton; black sheets, 24 guage, $91 per ton; 10 guage, $73 per ton; galvanized, 24 guage, $115 per ton; cold drawn quality, $107 per ton; and tin mill quality, $111 per net ton. Prior to the steel price increases, authorization was given for a $4 per ton boost in Canadian pig iron. These increases were authorized by the government. Companies not having taken advantage of this permission are expected to do so.

Steel Ingot Production by Districts and Per Cent of Capacity



Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
97.0*	95.5	92.0*	90.0	96.0*	99.0	101.0*	102.0	102.0	97.5	106.0	89.5	100.0*	96.0*
97.5	95.5	93.5	90.0	94.5	99.0	101.0	102.0	102.0	98.0	106.0	89.5	100.0	96.5**

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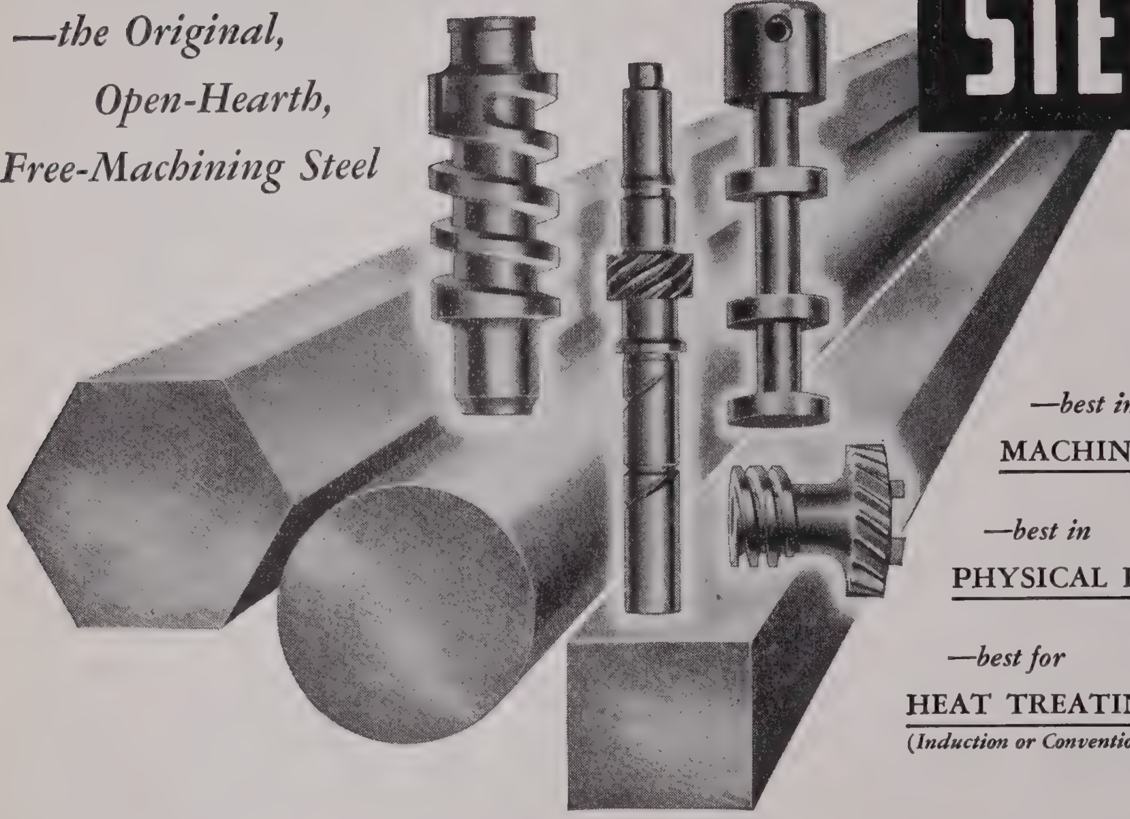

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JALCASE is supplied as cold-drawn or cold-drawn-with-metallurgical-processing such as special and varied tempering treatments. These thermal treatments are designed to improve physical properties, machinability, provide minimum distortion and increase wear resistance. Thus, many parts made of this material may need no further heat treatment after machining.

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Steel Men Say FTC Order Leaves the Basic Problem Unsolved

Question Of How To Compete By Absorbing Freight Is Still a Stumbling Block

By GEORGE F. SULLIVAN
Pittsburgh Regional Editor

Pittsburgh

• • • **The proposed** Federal Trade Commission order designed to revamp steel marketing dodges a key issue, according to many steel sales executives. THE IRON AGE editors discussed it last week with officials whose companies represent a majority of the steel industry. They read the order, looked up and said, "But this doesn't tell us how we can arrive at prices to meet competition?" They said it in different ways, some angry, some amazed. Sections of the proposed order came in for controversial interpretations. But this phase—or the lack of it—remains steel enigma No. 1.

Some said they thought the omission was not accidental. They believe that this order in combination with the Robinson-Pattman Act would force a uniform f.o.b. mill price system on the industry and its customers. The Cement and Rigid Conduit Cases were cited to support this thinking. Such a system implies a uniform mill net return on each product.

Freight absorption (lower mill net return on sales to more distant customers) would be discrimination, according to this theory. The short-haul customer could sue for triple damages, they argue, because the mill made more on him than his more remote competitor.

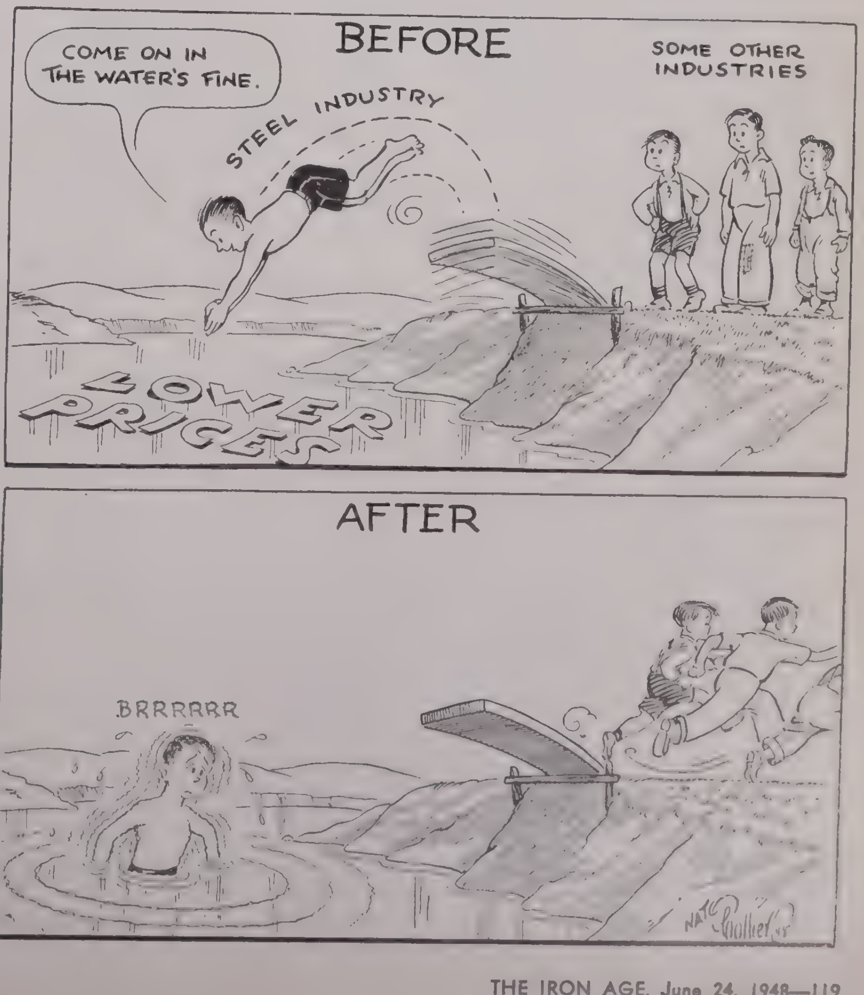
The alternative under this theory is to let the remote sale that yields a low mill net return set the price base for sales to all customers except on individually negotiated sales. This is the feature steel men say would foster local steel monopolies and backyard selling at all times. It sums up in the question: "If we are allowed to be competitive but not consistently competitive, how can we be competitive?"

The first part of Par. 1 of the order drafted by FTC trial counsellor Lynn C. Paulson indicates to many that they'll not be permitted o set a price anywhere except at he mill where each product is made. It appears to outlaw naming r recognizing a basing point at a ompetitor's plant. But the last entence merely seems to insist here be a price at every mill. The paragraph was not clear to anyone. Steel men hope FTC will clarify it.

Par. 2 sounds reasonable to most steel producers. That is, sales officials explained, unless it requires the uniform mill net return so many in the industry fear. But some steel companies will be hard hit productwise, some areawise.

Enforced f.o.b. mill sales on the relatively small group of products now based at some distance from production points would mean price boosts or profit cuts on these items—probably the former. A few other companies are so located that a good portion of their profits come from phantom freight charges. Here too the profit-price picture would be affected.

Least concern was voiced over Par. 3. It is generally interpreted as a ban on the institute's freight compilation, which represents the work of a number of steel companies, each supplying the rate data (mainly from government sources) for its area. Nor could there be a return to the rate book once compiled by Carnegie-Illinois' traffic department and widely used by others to save compilation cost. Rate books made up by individual



companies for their own use—or those of a commercial traffic publishing house would be legal, these men think. But again they feel the point should be clarified. Some customers, deprived of the institute's rate book, may be inconvenienced, it was said.

Mr. Paulson's belief that customers now cut off from supplies would benefit by a switch to f.o.b. mill sales is not shared in steel circles. "Why," said one steel official, "should I ship 460 miles to a man in Chicago just because he'll pay the freight? I can't satisfy the accounts I have now And that Chicago fellow will turn around and buy his steel in Chicago just as soon as things ease off. We'll take care of the nearby customers. They're our future bread and butter."

Some steel traffic men agree that more steel would move by truck under an f.o.b. mill system. The present practice of allowing the customer 65 pct of the rail freight rate if he sends a truck to the mill would be out. It would probably be replaced by a standard extra charge for truck loading because it usually costs more to load a truck than a gondola. Most barge shipments are now invoiced at rail freight rates for several reasons. An f.o.b. mill basis would end this practice and probably force more business to barges.

According to Mr. Paulson, stimulation of competition would eventually mean lower steel prices. This, steel officials say, may or may not be true but they do claim that their profits have been none too healthy in the face of rising postwar replacement costs.

At first glance, those questioned don't see how the change would stimulate fabrication in transit (a technique by which fabricators get partial credit for rail freight costs under certain conditions). No conclusive opinion was offered, however, pending further study.

A few possibilities for avoiding legal complications while still retaining the ability to compete have been talked of in the industry. Plans for new finishing mills in the big market areas of Detroit and the East are still in the talking stage. At current construction costs they'll probably stay there. One or two of the big producers might some day raise the money for such projects and customers would benefit by competition, but for 9 out of 10 steel companies it would be a pipe dream.

The idea of negotiating quarterly contracts with regular customers is occasionally tossed out for discussion. It would appear to cover the "individually negotiated sales" requirement that now faces the industry. But it would slow selling and operate efficiently only for those who regularly bought fair tonnages of the same products.

The Order

• • • Following exclusive presentation in THE IRON AGE, June 17, p. 123, of the basing point order that would vitally affect steel marketing, reactions of key steel executives were sought by THE IRON AGE district editors. The body of the order now being appraised by FTC is reprinted below. Prepared by Lynn C. Paulson, chief FTC trial counsellor in the current case, it calls on the steel industry and the American Iron & Steel Institute to:

"Cease and desist from using or engaging in any of the following methods, acts, practices, or things pursuant to or as part of a planned common course of action, combination or conspiracy through the American Iron & Steel Institute or otherwise:

"(1) Composing, establishing or announcing prices by using any other point than the point of production or shipment as a base, basing point, price base, or starting point; in other words refraining from having a plant price at every mill.

"(2) Refraining from having and quoting and using a price for any given product at the point of production for such product and offering to sell at that price the goods produced at that production point if said goods are offered for sale or sold anywhere in intra or interstate commerce; in other words, refraining from selling f.o.b. mill when requested.

"(3) Contributing to the compilation of or using in connection with naming, making or selling at a delivered price the compilations or lists of freight rates, or freight rate factors described in the findings supporting this order or any similar compilation or list; and, from using in connection with the naming, establishing or use of sale and delivered prices, any such compilation or list compiled or established by any competing company."

Construction Steel . .

• • • **Fabricated steel awards** this week included the following:

1040 Tons, Pinal County, Ariz., highway crossing and viaduct, Superior-Miami Highway, through Fisher Contracting Co. to Allison Steel Mfg. Co., Phoenix.

925 Tons, Chaves County, N. M., highway construction, U. S. 70, between Acme and Roswell, through J. H. Ryan, to Virginia Bridge Co., Roanoke, Va.

750 Tons, Lynn, Mass., Lynn Memorial City Hall through John Bowen Co., Boston, through Groisser & Slager Iron Works, Somerville, Mass.

730 Tons, Independence, Ore., bridge over Willamette River, through Macco Construction Co. to Moore Drydock Co., Oakland, Calif.

155 Tons, Cowlitz County, Wash., Toutle River bridge near St. Helen, through Hawkins & Armstrong, to Gunderson Bros. Engineering Co., Portland, Ore.

150 Tons, Woodford County, Ill., state highway bridge section 32RF, State Highway Dept. to Bethlehem Steel Co., Bethlehem.

100 Tons, Ephrata, Wash., U. S. Bureau of Reclamation Project 2242 to American Bridge Co., Pittsburgh.

100 Tons, Needham, Mass., Needham Hospital, through Rugo Construction Co., Boston, to Groisser & Shlager Iron Works, Somerville, Mass.

• • • **Fabricated steel inquiries** this week included the following:

545 Tons, Kingman, Ariz., highway bridge across Forebay Channel, Davis Dam, Bureau of Reclamation, Denver, Spec. 2289, bids to July 15.

500 Tons, Coram, Mont., U. S. Bureau fo Reclamation project 2278 penstocks. Bids due July 13.

400 Tons, River Foest, Ill., Rosary College Building.

310 Tons, Georgetown, N. D., Red River bridge, State Highway project 6646.

300 Tons, Chicago, Chicago Transit Authority Bus Terminal. W. E. O'Neill Co., low bidder.

• • • **Reinforcing bar awards** this week included the following:

600 Tons, Boston, Mass., Bell Telephone Building to Groisser & Shlager Iron Works, Somerville, Mass.

290 Tons, Independence, Ore., bridge over Willamette River, through Macco Construction Co. to Soule Steel Co., San Francisco.

250 Tons, Chicago, building for Goodman Mfg. Co. through Sumner Sollitt Co. to O. J. Dean Co.

205 Tons, Pinal County, Ariz., highway crossing, Superior-Miami Highway, through Fisher Contracting Co. to Allison Steel Mfg. Co., Phoenix, Ariz.

150 Tons, Modesto, Calif., settling pond and appurtenant structures, through Stockton Construction Co. to F. A. Klinger.

135 Tons, Chaves County, N. M., highway construction U. S. 70, between Acme and Roswell, through J. H. Ryan, to Darbyshire Harvie Iron & Machine, El Paso.

100 Tons, Shasta County, Calif., highway construction between Cottonwood and Anderson, through Fredrickson & Watson, to Bethlehem Steel Co., San Francisco.

• • • **Reinforcing bar inquiries** this week included the following:

100 Tons, Shrewsbury, Vt., Vermont Route 108, Rutland-Bellows Falls Rd.

• • • **Piling awards** this week included the following:

850 Tons, Chaves County, N. M., highway construction, U. S. 70, between Acme and Roswell, through J. H. Ryan, to Carnegie-Illinois Steel Corp., Pittsburgh.

Export Controls On Machine Tools Leave Producers On Hook

Reports That ERP Nations Are Supplying Russia Bring Complaints

By BILL LLOYD
Cleveland Regional Editor

Cleveland

• • • **Reports that Russia** and her satellite countries are getting machine tool shipments from European nations who stand to get a large part of the $6,000,000 in European recovery funds have industry observers wondering if the U. S. government did not strike a more vigorous blow at the machine tool industry than the Russians in placing machine tools under export controls March 1.

Machine tool shipments valued at about $8,000,000 (about 13,000 machines) ordered by European countries, principally Russia and Czechoslovakia, are blocked at the present time by authority of the State, Army, Navy and Commerce departments.

Bulk of these machines was ordered at a time when Russia's relations with the U. S. were relatively serene, but builders of the blocked machines, whether they are on the assembly floor or otherwise in advanced stages of completion, have no legal recourse. The sudden embargo faced commerce officials with the problem of finding some way of reimbursing U. S. machinery manufacturers, including machine tool builders, who were caught with these orders when the ban was announced.

It is understood that the case of the blocked orders rests at this juncture with the Machinery and Automotive Prdoucts Div., Office of International Trade, Dept. of Commerce. It is also understood that there is a movement under way to set up some sort of an authority for ECA Administrator Paul G. Hoffman to take the machines over, if he needs them. Rumor has it that Mr. Hoffman prefers that the RFC take the machines over.

The Department of Commerce, apparently is in the middle.

In any event, three possible ourses of action are open: ECA ould be authorized to take over he machines and equipment for which licenses cannot be issued and urn this equipment over to Holand, Belgium, etc.

Congress could take possible acion to reimburse the companies inolved which suffered loss through no fault of their own. Congress does not seem particularly disposed to do this, however, according to reports.

Or, the RFC might be authorized to take over the machines, turn them over to JANMAT or hold them until the international atmosphere clears, etc., etc.

Probably the most logical solution is for ECA to take over the tools and assign them where they will do the most good.

Government observers point out that machine tool builders could not have been completely unaware of the unhappy relationship of the U. S. and Russia, and could have protected themselves against possible loss by a clause in the sales contract whereby the supplier is relieved of all responsibility, but with full payment to him, if he were prevented from fulfilling the contract (in this case making shipment) by circumstances or forces beyond his control.

Another way might have been to require a down payment to cover the cost of production, or to make it absolutely certain, require full payment in advance.

None of these procedures, however, would appeal to a machine tool builder or any other manufacturer intent on building good sales relations with foreign customers.

However, a major reason behind the acceptance of these orders on an unrestricted basis was probably competition. Had the builders now holding the bag on the blocked orders attempted to write protective clauses into the contracts, the orders would have gone to their competitors, who would probably have been willing to take the business on an unrestricted basis.

Normally, the Commerce Dept. is the licensing agent. That is, in the past when a machine tool builder wanted an export license, he simply filled out the proper forms, sent them to the Commerce Dept. in Washington and in about 2 weeks his request was acted upon.

The present situation has many

(CONTINUED ON PAGE 122)

BIG SCISSORS: First product of Yugoslavia's new heavy machine tool factory, Ivo Lola Ribar (set up mainly with machinery received as reparations from British zone in Germany), is this 40-ton double scissors for cutting iron and steel scrap. Occasion for this exhibit was the second International Industrial Fair at Zagreb.

Industrial Briefs . . .

• MEN WANTED—Bureau of Mines, Washington, is seeking men with at least 6 years of mining experience, including 2 years of specialized work such as mining engineer, foreman or superintendent, to fill vacancies in the inspection service. Pay ranges from $4149 to $5905 annually.

• ACQUIRES PATENT—Merz Engineering Co., Indianapolis, manufacturers of precision gaging equipment and special machines, has acquired exclusive patent, manufacturing and sales rights of Jack & Heintz electronic inspection equipment to be marketed under the designation of Merz New-Tronic gages and sorting machines.

• NEW MANAGEMENT—Announcement has been made that K. W. Atwater Engineering, Inc., Pittsburgh, has passed into the hands of Kling Bros. Engineering Works of Chicago, manufacturers of metalworking machinery. The Atwater name and their address will remain unchanged.

• MERGER—Purchase of the Cochrane - Bly Co., Honeoye Falls, N. Y., by the Interstate Mfg. Corp., Orange, Conn., has been announced. Equipment and key personnel have been transferred to the Orange plant and will continue to produce vertical miller shapers, ferrous and nonferrous cold-cutting saws and saw sharpeners.

• DISTRIBUTOR — Harry F. Haldeman, Inc., 1106 S. Hope St., Los Angeles, has been appointed distributor in Southern California for Dravo Counterflo heaters, manufactured by Dravo Corp., Pittsburgh.

• ANNIVERSARY—S. G. Taylor Chain Co., Hammond, Ind., is celebrating its 75th anniversary under one management this year.

• ABRASIVE PLANT—Chemical Plants Div., Blaw-Knox Co., Pittsburgh, has received a contract from Carborundum Co., Niagara Falls, N. Y., for construction of an abrasive furnace plant at Vancouver, Wash. The award of about $2.5 million covers design, engineering, procurement and erection of a major portion of the project, including process equipment and structures.

• TOOL DISTRIBUTOR—Carboloy Co., Inc., Detroit tool manufacturers, has appointed Bittenbender Co., 126 - 132 Franklin St., Scranton, Pa., as its northeastern Pennsylvania distributor.

• ADDS TO PLANT—Erection of four buildings as additions to its existing engine manufacturing plant at Plainfield, N. J., as well as alterations to present structures has been started by Mack Trucks, Inc. When completed these additions and alterations will provide a new motor test room with new dynamometers.

• FORMS CORPORATION — National Welding Co., Newington, Conn., announced that it has dissolved its partnership and will now operate under the same management and ownership as a going corporation under the name of the National Welding & Mfg. Co.

• AMA DIRECTORS—Harold S. Vance, president and chairman of the board of Studebaker Corp. and E. J. Bush, president of Diamond T. Motor Car Co., have been elected vice-presidents and directors of the Automobile Manufacturers Assn. Mr. Vance succeeds Paul G. Hoffman, who recently resigned as Studebaker president to become administrator of the Economic Cooperation Administration. Mr. Bush replaces Robert F. Black, president of White Motor Co. Mr. Black will continue as AMA director.

Export Tools

(CONTINUED FROM PAGE 121)

unhappy portents, and the thing that probably worries the industry most is the money and effort spent in building up export trade.

At present, machine tools can be exported without government permission to foreign countries except European countries and certain other countries adjoining, including Algeria, Tunisia and French Morocco.

W. Averell Harriman, former Secretary of Commerce, told a press conference recently, when the new regulation was announced, that since Mar. 1 all shipments to Europe have been under direct control except for shipments valued at less than $100 and those goods that were on docks or on the way to the ports when the order became effective.

This new control on shipments to Europe does not mean that the Commerce Dept. has placed an embargo on all trade with Russia. It does mean that an export control has been put in effect to protect the national interest.

A sub committee of the Commerce Dept.'s inter-agency advisory committee has been set up to aid in developing policies regarding the export of industrial materials that would contribute directly to the war potential of the USSR and its satellites. This subcommittee includes representatives of the departments of State, Agriculture, Commerce, Interior, national military establishment, National Security Resources board, and the Atomic Energy Commission.

Export policies, it has been pointed out, must be flexible to meet any changes in the international situation. In the process of working out control criteria, the sub committee is scrutinizing license applications case by case. No shipments of materials that might contribute to the war potential of USSR and its satellites are licensed without prior consultation with the military agencies.

Aside from machine tool export to Russia from other countries, the ban raised the question as to what extent 1300 machine tools contribute to the Russian war potential. More than 1,000,000 machine tools were required to win World War II. Russia bought 11.8 pct of all machine tools exported by U. S. manufacturers in 1947.

Senate Small Business Hearings Leave Steel Men Annoyed, Cynical

See No Cure-All For Shortages While Senators Threaten Government Controls

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By GEORGE F. SULLIVAN
Pittsburgh Regional Editor

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Pittsburgh

• • • **Reaction in steel** circles to the tone of recent Senate Small Business Committee hearings on steel distribution varies from anger to cynicism. Anger because, according to one view, the steel industry is apparently expected to do the impossible or turn the job over to the government. Cynicism because some steel men regard the sessions as just part of Senator Wherry's re-election campaign.

If the cynics' viewpoint is correct, steel producers and their customers need not worry about government allocation of steel. But committee chairman Wherry, R., Neb., while declaring his opposition to federal controls has plainly threatened them. And Senator Murray, D., Mont., ranking minority committee member, demands them. So it appears to Washington observers that no matter who wins in November the specter of cries for government steel allocation will not be laid.

On the contrary, evidence indicates steel demand stiffened in recent weeks even before the full impact of European aid, rearmament and voluntary allocations has been felt. As those programs get up steam later this year domestic buyers will get less steel. Pleas for government allocation from quarters steel men consider misguided will mount. The hearings Senator Wherry's group held with the Steel Products Advisory Committee on May 28 and June 8 furnish a clue to the direction such allocation demands may take.

In questioning Paul Mackall, sales vice-president, Bethlehem Steel Co., Senator Wherry made an astonishing statement. Mr. Mackall had explained that when the extra load of the European Recovery Program came along some domestic business would have to be turned down. "As you drain off the top," he said, "there is that much less to distribute to others."

To this the committee chairman replied, "Certainly. So sometime in your experience when it comes to priority you are going to say, 'Boys, I will give it to you,' but you are going to take it away from somebody else. That is what we do not want to do. That is the point I am making. That is what we are here for."

Though he made much of withdrawals from distant areas and insisted that the small business man should be taken care of on a historical basis the Nebraska Republican further complicated the issue. "It is not only a question of the historical base," he asserted, "it is a question of whether or not the individual today can get into business. Many of them are veterans that ought to be entitled to get into business."

Senator Wherry said he wanted to find out how the steel industry was going to voluntarily allocate the steel left over from essential programs. He was amazed that the government had not told the steel producers what export and arms needs would be. He felt further that the steel industry committee should advise the government on what steel could be exported; was amazed to find that was outside the scope of the committee. The Saudi Arabian pipeline project disturbed him intensely because he knew of a Kansas company that had ordered pipe in 1945 and still had none.

The first (May 28) hearing ended with a request by the Senator that the steel men present consider the problem and return in 10 days. "If you are not going to furnish these supplies that have unfavorable freight rates, if there is no way we can get your advice as to what might be done with the balance of the steel that should be allocated somehow, or funneled out to the domestic economy on some sort of a basis, where are we going to be?"

The steel men remarked that it was a matter of individual cases and individual companies but agreed to study the matter. When they reconvened June 8 they repeated their original promise. "I said to you that I do not believe this lends itself to an industry approach since really individual companies are involved," said David F. Austin, sales vice-president, U. S. Steel Corp. of Delaware.

The junior senator from Nebraska was amazed as one steel company sales official after another repeated what each had said the previous week—that their group could not, as a group, work out steel allocations for small business, or for big business either.

TAKEN TO TASK: Senator Kenneth S. Wherry, R., Neb., chairman Senate Small Business Committee, charged that steel industry leaders "have failed to draft a voluntary formula for distributing steel that would protect small business." Seen before the committee, left to right, are: Henry Boher, director, executive council, Sharon Steel Corp.; D. B. Carson, vice-president, Sharon Steel Corp.; L. E. Creighton, chairman, Rotary Electric Steel Co.; J. K. Beeson, executive vice-president, Pittsburgh Steel Co.; John Virden, director, Industry Cooperation Div., Commerce Dept., and I. P. Stokes, olicitor, Commerce Dept.

Walter Watson, first vice-president, Youngstown Sheet & Tube Co., and Paul Mackall agreed with Mr. Austin. Senator Wherry continued to profess amazement that the steel distribution problem had not been solved in 10 days. He was unimpressed by evidence that warehouses received more steel in 1947 than in the prewar years; that several of the big companies had come up with figures showing big increases in shipments into states he called "steel starved."

"In listening to the discussion here this morning I am very much confused as a plain citizen," said Walter S. Doxsey of the American Steel Warehouse Assn. "We have so much steel available. The pie is only so big. It seems to me the first question to be determined by

(CONTINUED ON PAGE 142)

AMERICAN IRON AND STEEL INSTITUTE

Production of Open Hearth, Bessemer and Electric Steel Ingots and Steel for Castings

YEAR 1948

(Preliminary)

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January	6,768,497	95.5	343,169	77.5	361,110	79.0	7,472,776	93.6	1,686,857	4.43
February	6,245,338	94.3	340,596	82.3	354,270	82.9	6,940,204	93.0	1,676,378	4.14
March	6,841,578	96.6	363,235	82.0	403,322	88.2	7,608,135	95.3	1,717,412	4.43
1st Quarter	*19,855,413*	*95.5*	*1,047,000*	*80.6*	*1,118,702*	*83.4*	*22,021,115*	*94.0*	*1,693,932*	*13.00*
* April	5,640,168	82.2	185,089	43.2	392,900	88.7	6,218,157	80.4	1,449,454	4.29
† May	6,803,278	96.0	355,562	80.3	405,786	88.7	7,564,626	94.7	1,707,591	4.43
June										4.29
2nd Quarter										*13.01*
2nd 6 months										*26.27*
Total										*52.28*

Note—The percentages of capacity operated are calculated on weekly capacities of 1,599,286 net tons open hearth, 99,962 net tons Bessemer and 103,228 net tons electric ingots and steel for castings, total 1,802,476 net tons; based on annual capacities as of January 1, 1948 as follows: Open hearth 83,610,690 net tons. Bessemer 5,226,000 net tons, Electric 5,396,770 net tons, total 94,233,460 net tons.

* Revised.
† Preliminary figures, subject to revision.

PRINTED IN U.S.A

YEAR 1947

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		*Calculated weekly production (Net tons)	Number of weeks in month
	*Net tons	*Percent of capacity	Net tons	Percent of capacity	*Net tons	*Percent of capacity	*Net tons	*Percent of capacity		
January	6,550,058	95.2	384,096	87.7	288,458	66.9	7,222,612	93.2	1,630,386	4.43
February	5,835,018	93.9	314,912	79.6	280,471	72.0	6,430,401	91.9	1,607,600	4.00
March	6,619,641	96.2	378,893	86.5	318,440	73.8	7,316,974	94.4	1,651,687	4.43
1st Quarter	*19,004,717*	*95.1*	*1,077,901*	*84.8*	*887,369*	*70.9*	*20,969,987*	*93.2*	*1,630,637*	*12.86*
April	6,365,670	95.5	375,675	88.6	310,497	74.3	7,051,842	93.9	1,643,786	4.29
May	6,640,004	96.5	372,878	85.2	326,132	75.6	7,339,014	94.7	1,656,662	4.43
June	6,317,705	94.8	351,247	82.8	308,762	73.9	6,977,714	92.9	1,626,507	4.29
2nd Quarter	*19,323,379*	*95.6*	*1,099,800*	*85.5*	*945,391*	*74.6*	*21,368,570*	*93.9*	*1,642,473*	*13.01*
1st 6 Months	*38,328,096*	*95.4*	*2,177,701*	*85.2*	*1,832,760*	*72.8*	*42,338,557*	*93.5*	*1,636,589*	*25.87*
July	6,033,512	87.9	256,125	58.6	289,048	67.2	6,578,685	85.1	1,488,390	4.42
August	6,329,497	92.0	346,033	79.0	315,622	73.2	6,991,152	90.2	1,578,138	4.43
September	6,152,348	92.5	334,425	79.0	310,684	74.6	6,797,457	90.8	1,588,191	4.28
3rd Quarter	*18,515,357*	*90.8*	*936,583*	*72.2*	*915,354*	*71.6*	*20,367,294*	*88.6*	*1,551,203*	*13.13*
9 Months	*56,843,453*	*93.8*	*3,114,284*	*80.8*	*2,748,114*	*72.4*	*62,705,851*	*91.9*	*1,607,842*	*39.00*
October	6,831,984	99.3	384,272	87.8	353,896	82.1	7,570,152	97.7	1,708,838	4.43
November	6,543,390	98.2	360,620	85.0	338,417	81.0	7,242,427	96.5	1,688,211	4.29
December	6,654,966	96.9	373,367	85.5	347,308	80.7	7,375,641	95.4	1,668,697	4.42
4th Quarter	*20,030,340*	*98.1*	*1,118,259*	*86.1*	*1,039,621*	*81.3*	*22,188,220*	*96.5*	*1,688,601*	*13.14*
2nd 6 months	*38,545,697*	*94.4*	*2,054,842*	*79.1*	*1,954,975*	*76.4*	*42,555,514*	*92.6*	*1,619,928*	*26.27*
Total	76,873.793	94.9	4,232,543	82.1	3,787,735	74.6	84,894,071	93.0	1,628,195	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,553,721 net tons open hearth, 98,849 net tons Bessemer and 97,358 net tons electric ingots and steel for castings, total 1,749,928 net tons; based on annual capacities as of January 1, 1947 as follows: Open hearth 81,010,990 net tons, Bessemer 5,154,000 net tons, Electric 5,076,240 net tons, total 91,241,230 net tons.

* Revised January through December, 1947.

Weekly Gallup Polls . . .

Voting Public Found Hardened to Platform Promises

Princeton, N. J.

• • • **The platform** makers meeting in Philadelphia face two basic problems in presenting their platform to the public, according to George Gallup, director, American Institute of Public Opinion.

(1) Only a small percentage of voters ever read presidential party platforms, or remember what is in them, or pay much attention to them.

(2) The platform committees will have a harder time than usual drawing up a document that will influence voters, because no large proportion of voters seem aroused today over any one particular issue, and next, there is comparatively little difference of opinion among Republican and Democratic voters on such issues as do exist.

True, there are differences of opinion about personalities—President Truman and the GOP leaders of Congress are carrying on a colorful vendetta at the moment. There is disagreement too as to which party or candidate can run the country most efficiently.

But polls find that the average Republican voter and the average Democratic voter show no marked difference of attitude on such public matters as the draft, Russia, the Marshall Plan, Federal aid to education, reciprocal trade agreements, the Taft-Hartley Act, government ownership, the United Nations, the oleomargarine tax, or social security. There are some differences on civil rights, on the wisdom of rentroducing price control and on the question whether income taxes are too high. But these differences are not great.

The original idea of the presidential party platform was to set forth clearly and boldly the principles and policies for which the party stood.

But voters nowadays have apparently come to the conclusion hat platforms are usually vague atch-alls promising all things to all men, designed to placate all groups and offend no one.

This is undoubtedly the reason why a survey in 1944 a few weeks after publication of the Republican platform found that fewer than two voters in every five (36 pct) claimed to have read any part o fit.

Even groups who might be expected to have special interest in individual planks, such as farmers in the farm planks or union labor in the labor provisions, showed almost complete lack of familiarity with those parts of the platform.

In 1940—the year in which the nation faced the grave issue of war —even fewer voters bothered to read the Republican platform on which Wendell Willkie ran or the Democratic platform of Mr. Roosevelt.

Patforms are necessary to give party workers consistent sets of arguments to use in campaign talks, and through such talks the ideas in the platform gain some circulation. But the platform documents by themselves apparently have gotten comparatively little attention in the past.

A significant fact this year is that only about one third of the voters have any particular idea or plank which they would like to see adopted by their party. Moreover, those who do have something in mind suggest an immensely wide variety of things, with no crystallization or focusing of major attention on any particular one.

From coast to coast voters were asked by the institute:

"Is there any particular idea or plank which you would like your party to include in its party platform for the coming presidential election?"

The vote:

	Yes Pct	No Pct
Republicans	34	66
Democrats	31	69
Independents	40	60
All U. S.	34	66

Few Voters Read or Recall Presidential Party Pledges In 1940 or 1944, Poll Shows

° ° °

While it is true that the paltform makers will hear from articulate minorities and special interests, the above survey suggests that there is nothing which seems to be "burning up" any large number of people.

This is further evidenced when those who answered "yes" to the above question were asked what they would like to see their party do.

The item most frequently mentioned by all groups was "lower the cost of living." But significantly the number mentioning this one problem amounted to only one sixth of the total.

Various suggestions having to do with labor problems came next, followed by housing, but each of those topics was named by far fewer than one sixth. Then came a long string of items each of which got only a few percent—stronger foreign policy, improved education, insuring peace, preparedness, veteran's bonus, health insurance, more old age assistance, government economy, etc.

The scatteration of items, the fact that nothing stood out prominently and above all the fact that so few could think of anything they want done, is an indication of the problem which platform makers face this year.

Independent voters showed somewhat more interest than others in platform planks. But the main difference was that they thought up an even wider variety of items with, again, nothing standing out prominently.

Changes in Capital Goods Industries Highlighted in MAPI Meet

Washington

• • • **Many fundamental** concepts of doing business today, as applied particularly to the capital goods industry, were topics considered at the 1948 annual meeting of the Machinery and Allied Products Institute here recently. Top ranking industrialists and heads of government agencies described in detail today's trends in business and their effects upon heavy industry.

Subjects ranging from the effects of the Marshall Plan on exports through the activities of the Munitions Board, technological implications of atomic energy; and Government contract cost principles were discussed.

Many machine tool builders have operated in the red for three consecutive post-war years, A. G. Bryant, president, National Machine Tool Builders' Association, told the meeting.

Mr. Bryant, who is vice-president, Cleereman Machine Tool Co., and president of Bryant Machinery & Engineering Co., said many Machine Tool Builders at the present time are wondering how long their reserves, saved out of a war experience with maximum excess profit taxes and renegotiation will last.

Industrialists and Government Men Discuss Fundamental Business Concepts

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From a war peak annual rate of three and one-half billions, the industry reduced its capacity to 600 million and yet was able to operate with only half of this reduced capacity, or 307 million.

While predicting that the "tenacity and resourcefulness" of the industry will carry it through, Mr. Bryant branded the bullish enthusiasm of some observers as to the current outlook of the industry as unwarranted.

"No one knows what effect the present defense programs may eventually have upon the machine tool business," Mr. Bryant declared.

"Some companies will be required to furnish machines for some phases of the program. However, with twice as many machine tools existing in this country as were here in 1939, it is difficult to see how the present defense needs can possibly place heavy demands upon the entire machine tool industry."

He pointed out that the industry has lost this year a large part of its normal export business because of the inability of foreign countries to obtain dollars for purchase, holding out the hope that this normal export business might be restored after the Economic Cooperation Administration gets organized to handle capital goods. He added that there will be months of waiting for this eventuality.

Mr. Bryant said the industry could double its deliveries of machines to the continental U. S. besides handling expected foreign requirements, without increasing capacity.

* * *

Sumner T. Pike, vice-chairman of the Atomic Energy Commission, pointed out that the prospective use of atomic energy in power generation is not as likely as it appeared to be 2 years ago. The reasons for this present outlook are several. Engineering methods of generating power by nuclear fission are not established; and power generated from heat from the piles is expensive.

Mr. Pike said that General Electric engineers believe that temperatures around 1000°F will have to be the basis of atomic power generation, but indicated that some of the ivory-towered theroists hold out for temperatures in the range of 1800 to 2000°F for greater efficiency.

The serious question in the latter proposal is that there are no structural materials economically suitable for such temperatures. Also, shielding is a definite problem, since components of steel as a structural material become radioactive. Carbon in the steel becomes lethal after lengthly exposure to radioactive uranium.

In discussing possible structural materials for use in atomic power plants, Mr. Pike confirmed a claim made by a Westinghouse research engineer some 6 or 8 years ago. when he said that titanium would some day become a common structural material. Ranking fourth among the elements from the standpoint of availability, Mr. Pike said that it has much to offer structurally. Its strength-weight ratio is

Coming Events

June 28-July 1 **American Electroplaters' Society,** Convention and Industrial Finishing Exposition, Atlantic City.

June 30-July 2 **Machinery Dealers National Assn.,** convention, French Lick Springs, Ind.

July 16-24 **American Road Builders' Assn.,** convention and Road Show, Soldier Field, Chicago.

July 26-27 **Institute of Scrap Iron & Steel,** midyear meeting, Atlantic City.

Aug. 30-Sept. 3 **American Chemical Society,** national meeting, Washington.

Sept. 6-10 **American Chemical Society,** national meeting, St. Louis.

Sept. 13-17 **American Chemical Society,** national meeting, Portland, Ore.

Sept. 13-17 **Instrument Society of America,** conference and exhibit, Philadelphia.

Sept. 28-Oct. 1 **Assn. of Iron & Steel Engineers,** Convention and Iron and Steel Exposition, Cleveland.

about 50 pct that of structural steel, it melts at a considerably higher temperature, and holds its strength at temperatures much closer its melting point than does steel.

The most likely use of atomic energy as a power plant is in Naval vessels and possibly commercial shipping. Shielding requirements almost make impossible its use as the power media for automobiles and aircraft. Terrific plant investment makes it somewhat unfeasible for stationary power plant and utility use, at least at its present stage of development.

Coolants and heat exchangers required in the generation of atomic energy for power plant use also pose severe problems. At temperatures in the range of 2000°F, inert gases may have to be used as coolants. One such gas would be helium, but the high pressures and velocities required give rise to abrasion and corrosion problems. Such metals as sodium and potassium might be used, but again mechanical handling problems occur. The use of mercury is impossible because of certain nuclear actions that might occur. Gallium is an ideal metal for this purpose, but the supply is extremely limited.

* * *

Speaking in place of John J. McCloy, president of the International Bank for Reconstruction and Development, George MacLaine, also of the International Bank, outlined the "Outlook for Capital Goods Exports to Latin America" He claimed that since the war, much of the dollar exchange in Latin America has been used up, and financing will become an increasingly difficult problem Since every capital goods purchase is based on credit, it must be paid for by equity capital or borrowed money. In borrowing, there poses a problem of creditor confidence in the borrower, in his venture, and in the politics and the social structure of his country. Unstability of political conditions in some Latin American countries tend to brake capital investment.

Transportation and communication facilities in Latin America also tend to hinder capital goods exports in that direction, since the equipment sent must be delivered and the products of its use must be marketed. Inadequate facilities for this movement of materials limit the amount that will be purchased. Manpower, especially the type required to handle, operate, and maintain agricultural and industrial machinery, is sadly lacking. It will take time to educate the masses in Latin America to a mechanical era.

The answer to many of the problems in South American countries is the same as the answer to problems in United States and Europe: increased productivity. To gain this objective in South America, however, Mr. MacLaine stated that the exporter of capital goods must see to it that his equipment is packaged so it can be delivered with present facilities; that manpower with the know-how to use it will recevie it; and that the equipment is properly serviced, likely by the manufacturer.

Sound monetary exchange practices must be adopted, which political conditions of some countries prohibit. The lack of sound monetary systems in these countries discourage long range investment and encourage speculative investment. Local capital is not available. Since much of the capital goods exports to Latin America must be financed outside of the recipient country, the International Bank became a necessity. It can make loans, but available loanable resources are inadequate for all demand. If they were adequate, however, Mr. MacLaine claimed it would be economically unsound to finance all worthy projects by loans. He believes they should be financed as far as possible by equity invest-

(CONTINUED ON PAGE 142)

50 YEARS AGO

THE IRON AGE, *June 23, 1898*

- "Reports have been current in New York during the past few weeks that the Carnegie Steel Co. has purchased ground in the vicinity of the works of the Illinois Steel Co. These rumore were probably started to help boom land in that vicinity."

- **"Continuous melting is becoming much more common in larger foundries producing unlimited quantities of castings of the same pattern, as the work can be done more systematically and with greater economy."**

- "The advantages of automatic stokers and forced draft are becoming so generally recognized that their application is reaching into almost every field where steam is used for either power or heat. One of the latest innovations is a combined engine and blower designed by the American Blower Co. of Detroit for marine service on harbor and lake tugs."

- **"It is believed that the comparatively short period of 7 years almost entirely changes the character of a business. In other words, the man who totally withdraws from participation in a business will find on reentering in 7 years later that most of his former technical knowledge is behind the times and he must learn the business all over again."**

- "Statistics on the production of openhearth steel posses unusual interest. They show how enormously that branch of manufacture has increased, rising from 784,936 gross tons in 1894 to 1,631,843 tons in 1897. Separation of acid from basic hearth steel was first made in 1896."

- **"Accounts have recently been made public of a great canal project about to be undertaken by the Russian government. The canal will connect the Baltic with the Black Sea, enabling Russia to concentrate her fleet at either end in less than a week."**

Builders Are Disturbed By Gradual Decline in New Firm Orders

• • • **Easily the most** disturbing factor in the machine tool market for the past several months, according to industry observers, has been the gradual decline in new firm orders, foreign and domestic.

Except in periods preceding price increases, when new orders were "smoked out," the industry has been doing business on a steadily declining plane, which is again evident in preliminary reports of May business.

On the basis of these preliminary reports, new firm orders in May dropped 10 pct from April overall, foreign orders were down 20 pct. Cancellations, while still small on a total business basis, were double April's and approximately 50 pct foreign in total. Shipments were off slightly, probably no more than 2 pct.

With the end of May, the industry is on the threshold of a seasonally quiet period, and as May reports suggest, the defense programs are not under way as yet. In the normal course of events, the third quarter is seasonally off for the machine tool industry and some observers believe the industry will be doing well to match second quarter volume—probably no better.

In ECA and the defence program, the industry has a couple of irons of important sizes in the fire, but ECA purchases, according to reports, are now 6 months away, and defense program buying will not come in volume before fall.

On the other hand, a third round of wage increases and higher prices, which seem to be starting in the major industries, will do machine tool builders no good, for anything that destroys confidence hurts machine tool sales.

In Detroit, most segments of the machine tool industry appear to be marking time at the moment. In addition to the present lull in machine tool ordering, a current strike of Detroit tool and die makers has idled more than 800 shops. The shutdown may, if prolonged sufficiently, have a serious retarding effect on machine tool deliveries, it is believed.

Business Is Steadily Declining Except During Periods Before Price Rises

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Interesting developments during the past week included further ordering by Reo as part of a program that is estimated to cost upwards of $2 million. On the disappointing side was a notice of a hold-up of work on a program for Chevrolet-Saginaw. The stoppage is believed to be only temporary, according to informed sources.

Ordnance Day in Detroit last week has revived and given new credence to reports that extensive new tooling may be required to implement the defense program. Reported placement last week of an order for 2200 planes is only a small part of the program that is expected to call for the building of many hundreds of planes and is reliably said to call for extensive moving of aircraft plants away from coastal areas. At least one Detroit source has received orders for new tooling for the current aircraft program. High on the list of new tooling required, it is believed, will be special equipment for jet engines.

Introduction of the new Ford in New York last week has set the Detroit rumor factory to work again on proposed introduction dates for the new GM and Chrysler models. Based on machine tool delivery schedules, it is believed that almost without exception, November will be the earliest introduction date for new GM and Chrysler cars, despite reports heard here recently that Chrysler might have one of its lines ready for an August debut.

In Washington, adoptions of a more liberal policy on depreciation was recommended as a means of allowing small business to build up its cash assets, by George S. Eaton, executive secretary, National Tool and Die Manufacturers Assn., before the subcommittee on finance, House Select Committee on Small Business.

Mr. Eaton charged that the present practices of the Bureau of Internal Revenue are highly unsatisfactory and inequitable in many cases, and that BIR agents generally refuse to allow accelerated depreciation for more than normal usage of equipment.

"These difficulties date from 1934, at which time the BIR shifted the burden of proof to the taxpayer, making him establish that the depreciation taken is in accord with the new policy adopted.

"In view of the large actual loss on resale value as soon as a machine becomes second hand, the taxpayer should be allowed to write off up to 30 pct of the cost of new machines the first year, if desired," he declared.

He added that in normal times that represents generally the loss in value of the equipment when it is first set up for use.

"The much higher prices now in effect than in the days when most of the present equipment was bought have brought a very serious problem, in securing funds for replacement, whereas a liberalized policy on depreciation would encourage the replacement of old machines with more efficient and cost reducing equipment by small businesses," Mr. Eaton pointed out.

In the East, major segments of the industry report business fair and invariably add "and only fair." Exceptions include one of the largest manufacturers' representatives with agents in every New England state. This firm's June bookings have not been even fair and definitely below June 1 expectations. Generally, the trade awaits orders from aircraft, sub and sub-subcontractors, and in some quarters it is believed that these sub and subcontractors are sufficiently tooled up to handle their aircraft program requirements.

In the meantime, the trade is becoming more inclined to look for export rather than airplane business. It is quite probable New England machine tool builders will cut down activities in July when vacations will be in order.

SCRAP

. . . **News and Market Activities**

Market Strong, But Only Specialties Move Up

New York

• • • **The scrap market** this week was poised to move but lacked the punch. Most consumers were having good luck in keeping prices in line. But some of this was not real luck—overgrading is on the upgrade again.

There are some scrap consumers who are not overly anxious to take a good peek at scrap which they have bought as low phos or "extra" good No. 1 steel. It may be just as well that they don't. But in the overall it looks like steelmakers will not be faced with a runaway market—yet.

From some districts come reports that scrap supplies are larger but this is by no means true of all areas. In fact, it may be whistling in the dark because there are days ahead for the industry when it will be necessary to give serious thought to the winter.

As for scrap from abroad, those who are cynical or know their stuff in the scrap business are not counting to much on any windfall from that quarter.

Many steelmakers believe that, after all is said and done, most foreign scrap will be used abroad. If used here the costs would be prohibitive. There will be some imports but nowhere near the figures now being buzzed about.

This week most areas find demand good, inspection fair to medium.

•

PITTSBURGH—Price activity was at a minimum during the past week though the latest railroad awards sent specialties up 50¢. A bit less firmness in cast is being talked but prices hold. No weaknesses reported in steelmaking grades and good short shoveling turnings are very hard to come by. Rejections are said to be falling off, partly because dealers are hesitant to risk return freight charges, partly because mills want to lay down as much material as they can. Overgrading, with the knowledge of those who buy the overgraded steelmaking scrap, continues.

•

CHICAGO—Scrap shipments have begun to taper off with a further drop expected next month. July vacations in many manufacturers' shops plus a drop in scrap coming in off the farms are expected to affect receipts. The railroads' strenuous drive to collect all scrap has about cleaned up this reservoir. Mills are automatically extending their contracts and will continue to do so as long as the prices do not change. On remote shipments some mills are paying the full freight including the last increase in cases where orders were placed prior to Apr. 20 and have not yet expired. Railroad lists closed higher last week on some items. Cast scrap is still strong as foundries are being forced to use a higher scrap mix because of the pig iron shortage.

•

PHILADELPHIA—The scrap market here continues strong in all grades but there were no price changes last week. Major grades are subject to what is in effect a continuing industry price control. There is little profit for brokers in current transactions in steel grades as dealers are holding out for the top limit of prices. Brokers' returns depend largely on activity in specialties. When brokers take an order for heavy melting grades, they do not know whether it will be possible to fill the whole tonnage because of the current difficulty in buying scrap. The quality of shipments continues poor and a new factor has entered the market in the rejection of cars by several mills. Alan Wood's small furnace has been taken out of blast for relining, a blow to foundries in the area, but the development has not weakened the cast market.

•

CLEVELAND—Shipments are off here and in the Valley. Scrap is shortening up and the market, particularly in openhearth grades, is very firm. Except for the fact that mills are comfortable, all factors necessary to a rise in price are present. A lot of scrap has moved in the past 45 days, and with plant vacations in full swing, dealers complain they cannot buy any scrap. Light shells brought $52.00 Ravena, Ohio, last week, and in general prices paid for government offerings are more than dealers can get. Superficially at least, much of the present tightness seems to stem from anticipation of a suspension in coal mining operations, and the plant vacation period. In any event, the next 2 or 3 weeks are going to be rough.

•

DETROIT—The underlying tone of the Detroit openhearth market continues strong with prices holding at formula. While some sources have indicated that a break through on the top side of the range is possible the present strong scrap position of mill buyers here will undoubtedly be a restraining factor. A strike in Detroit tool and die shops has brought many jobbing foundries here to a halt, causing a further weakening in the price of cast grades.

•

BUFFALO—Underlying strength of openhearth scrap was mroe noticeable despite the lack of important new buying. Dealers said supplies were dwindling due to a combination of circumstances and foresaw no improvement before August at the earliest. Among the influences cited were the cleanup of spring offerings, increased cross-hauling on reciprocal deals and plant vacations. One of the leading consumers was reported digging into reserves to maintain operations and the heat was on shippers to step up deliveries. Between 4000 and 5000 tons were due to arrive this week by barge canal from New York and a 5000-ton cargo was expected by Lake next week. Sloppy conditions prevailed in the cast scrap section with low grade run-of-yard stuff reported being offered at $55.00 without takers.

•

BIRMINGHAM—Although agricultural scrap is moving in seasonably small volume, mills are obtaining sufficient openhearth material from other sources to meet requirements. Cast continues in fairly good supply but poor in quality. Electric furnace grades have become slightly tighter but this condition has yet to affect prices.

•

NEW YORK—Steel scrap grades are scarce in this market and holding firm at previous levels. Cast scrap is weak but so far there is no change required in prices. An indication of the difference in strength in cast grades between the Philadelphia market where they continue very strong and the eastern market is contained in the news that one western New Jersey pipe foundry received 13 cars of cast in a single day last week, the largest day's receipts since before the war, but there wasn't a single car from Philadelphia. The cast market here is weak because the activity of foundries is slowing down. Shipments of heavy melting to eastern Pennsylvania are reported here to be higher than the normal postwar tonnages.

•

CINCINNATI—The market here is substantially without change. Openhearth grades are strong and moving at the formula. Cast is weaker, but not pricewise, with a number of foundries holding up shipments until July 15. A number of plants are down on vacation, and material is moving into this area from outlying districts.

•

BOSTON—Prices for steelmaking scrap continue at formula in theory, but there is some question whether this is so in practice. Rumors persist that many are not adhering to formula prices. Following the break in the cast market, the price of chemical borings dropped slightly from $38.00 to $39.00 a ton to $36.50 to $37.00 a ton. Prices for heavy breakable and stove plate remain unsteady.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00 to	$40.50
RR. hvy. melting	41.00 to	41.50
No. 2 hvy. melting	40.00 to	40.50
RR. scrap rails	55.50 to	56.50
Rails 2 ft and under	62.50 to	63.50
No. 1 comp'd bundles	40.00 to	40.50
Hand bdld. new shts.	40.00 to	40.50
Hvy. axle turn.	41.50 to	42.00
Hvy. steel forge turn.	41.50 to	42.00
Mach. shop turn.	35.50 to	36.00
Shoveling turn.	38.00 to	38.50
Mixed bor. and turn.	35.50 to	36.00
Cast iron boring	38.00 to	38.50
No. 1 cupola cast	63.00 to	64.50
Hvy. breakable cast	52.00 to	53.00
Malleable	76.00 to	77.00
RR. knuck, and coup.	55.50 to	56.50
RR. coil springs	55.50 to	56.50
R.R. leaf springs	55.50 to	56.50
Rooled steel wheels	55.50 to	56.50
Low phos.	48.00 to	48.50

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.00 to	$39.50
No. 2 hvy. melting	39.00 to	39.50
No. 1 bundles	39.00 to	39.50
No. 2 dealers' bundles	39.00 to	39.50
Bundled mach. shop turn.	37.00 to	37.50
Galv. bundles	35.00 to	35.50
Mach. shop turn.	34.00 to	34.50
Short shov turn.	35.50 to	36.50
Cast iron borings	36.00 to	37.00
Mix. borings & turn.	34.00 to	34.50
Low phos. hvy, forge	48.00 to	50.00
Low phos. plates	45.00 to	46.00
No. 1 RR. hvy. melt.	41.25 to	41.75
Rerolling rails	54.00 to	55.00
Miscellaneous rails	51.50 to	52.50
Angles & splice bars	54.00 to	55.00
Locomotive tires, cut	55.00 to	55.50
Cut bolster & side frames	48.00 to	49.00
Standard stl. car axles	60.00 to	62.00
No. 3 steel wheels	52.00 to	53.00
Couplers & knuckles	53.50 to	54.00
Rails, 2 ft and under	56.00 to	57.00
Malleable	76.00 to	78.00
No. 1 mach. cast	69.00 to	70.00
No. 1 agricul. cast	60.00 to	63.00
Heavy breakable cast	55.00 to	60.00
RR. grate bars	62.00 to	65.00
Cast iron brake shoes	58.00 to	59.00
Cast iron carwheels	61.00 to	62.00

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$38.50 to	$39.50
No. 2 hvy. melting	38.50 to	39.50
No. 1 bundles	38.50 to	39.50
No. 2 bundles	38.50 to	39.50
Mach. shop turn.	33.00 to	33.50
Shoveling turn.	35.00 to	35.50
Cast iron borings	32.50 to	33.00
Mixed bor. & turn.	32.50 to	33.00
Low phos., plate	46.00 to	48.00
No. 1 cupola cast	63.00 to	64.00
Hvy. breakable cast	53.00 to	54.00
Rails 18 in. & under	60.00 to	61.00
Rails random length	50.00 to	51.00
Drop broken	66.00 to	68.00

BOSTON

Dealers' buying prices, per gross ton, f.o.b. Boston

No. 1 hvy. melting	$31.65 to	$31.90
No. 2 hvy. melting	31.65 to	31.90
Nos. 1 and 2 bundles	31.65 to	31.90
Busheling	31.65 to	31.90
Shoveling turn.	....	28.90
Machine shop trun.	....	26.90
Mixed bor. & turn.	....	26.90
Cl'n cast chem. bor.	36.50 to	37.00
No. 1 machinery cast	55.00 to	57.00
No. 2 machinery cast	54.00 to	56.00
Heavy breakable cast	53.00 to	53.50
Stove plate	51.00 to	52.00

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	....	$35.50
No. 2 hvy. melting	....	35.50
No. 1 bundles	....	35.50
New busheling	....	35.50
Flashings	....	35.50
Mach. shop turn.	$29.00 to	29.50
Shoveling turn.	30.00 to	30.50
Cast iron borings	30.00 to	30.50
Mixed bor. & turn.	28.50 to	29.00
Low phos. plate	39.50 to	40.50
No. 1 cupola cast	52.00 to	55.00
Heavy breakable cast	45.00 to	50.00
Stove plate	48.00 to	50.00
Automotive cast	52.00 to	55.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.00 to	$43.00
No. 2 hvy. melting	38.50 to	39.00
No. 1 bundles	42.00 to	43.00
No. 2 bundles	38.50 to	39.00
Mach. shop turn.	34.50 to	35.00
Shoveling turn.	34.50 to	35.00
Mixed bor. & turn.	34.50 to	35.00
Clean cast chemical bor.	42.00 to	44.00
No. 1 machinery cast	66.00 to	68.00
No. 1 mixed yard cast	62.00 to	63.00
Hvy. breakable cast.	63.00 to	64.00
Clean auto cast.	65.00 to	66.00
Hvy. axle forge turn.	44.00 to	45.00
Low phos. plate	48.00 to	49.00
Low phos. punchings	48.00 to	49.00
Low phos. bundles	46.00 to	47.00
RR. steel wheels	52.00 to	53.00
RR. coil springs	52.00 to	53.00
RR. malleable	75.00 to	78.00
Cast iron carwheels	68.00 to	70.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$41.00 to	$42.00
No. 2 hvy. melting	37.50 to	38.50
Bundled sheets	37.50 to	38.50
Mach. shop turn.	33.00 to	33.50
Locomotive tires, uncut	46.00 to	47.00
Mis. std. sec. rails	49.00 to	50.00
Steel angle cars	....	49.50
Rails 3 ft and under	53.00 to	55.00
RR. steel springs	48.50 to	49.50
Steel car axles	54.00 to	55.00
Grate bars	59.00 to	60.00
Brake shoes	57.00 to	58.00
Malleable	72.00 to	73.00
Cast iron car wheels	61.00 to	62.00
No. 1 machinery cast	65.00 to	67.00
Hvy. breakable cast	58.00 to	59.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy, melting	....	$37.50
No. 2 hvy, melting	....	37.50
No. 2 bundles	....	37.50
No. 1 busheling	....	37.50
Long turnings	$25.00 to	26.00
Shoveling turnings	27.00 to	28.00
Cast iron borings	26.00 to	27.00
Bar crops and plate	42.50 to	43.50
Structural and plate	42.50 to	43.50
No. 1 cupola cast.	64.00 to	67.00
Stove plate	63.00 to	64.00
No. 1 RR. hvy, melt.	....	38.50
Steel axles	51.00 to	52.00
Scrap rails	44.00 to	45.00
Rerolling rails	51.00 to	53.00
Angles & splice bars	51.00 to	53.00
Rails 3 ft & under	52.00 to	55.00
Cast iron carwheels	50.00 to	55.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00 to	$40.50
No. 2 hvy. melting	40.00 to	40.50
Mach. shop turn.	35.00 to	35.50
Short shov. turn.	37.00 to	37.50
Cast iron borings	36.00 to	36.50
Low phos.	45.00 to	45.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$36.50 to	$37.50
No. 2 hvy. melting	....	34.50
No. 2 bundles	....	34.50
Mach. shop turn.	29.00 to	29.50
Mixed bor. & turn.	29.00 to	29.50
Shoveling turn.	31.00 to	32.00
No. 1 cupola cast	55.50 to	56.50
Clean auto cast	55.50 to	56.50
Hvy. breakable cast	55.00 to	56.00
Charging box cast	55.00 to	56.00
Unstrp. motor blks.	52.00 to	53.00
Cl'n cast chem. bor.	34.50 to	35.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy, melting	$39.75 to	$45.00
No. 2 hvy. melting	....	39.75
No. 1 bundles	....	39.75
No. 2 bundles	....	39.75
No. 1 busheling	....	39.75
Mach. shop turn.	34.75 to	35.00
Shoveling turn.	35.00 to	36.00
Cast iron borings	....	35.75
Mixed bor. & turn.	....	34.75
No. 1 cupola cast	64.00 to	65.00
Mixed cupola cast	60.00 to	61.00
Charging box cast	56.00 to	57.00
Stove plate	60.00 to	61.00
Stove auto cast	60.00 to	61.00
RR. malleable	70.00 to	75.00
Small indl. malleable	47.00 to	49.00
Low phos. plate	44.75 to	46.00
Scrap rails	50.00 to	52.00
Rails 3 ft & under	57.00 to	58.00
RR. steel wheels	51.00 to	52.00
Cast iron carwheels	51.00 to	52.00
RR. coil & leaf spgs.	51.00 to	52.00
RR. knuckles & coup.	51.00 to	52.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.50 to	$40.00
No. 2 hvy. melting	39.50 to	40.00
No. 1 bundles	39.50 to	40.00
No. 1 busheling	39.50 to	40.00
Drop forge flashings	39.50 to	40.00
Mach. shop turn.	34.50 to	35.00
Shoveling turn.	36.50 to	37.00
Steel axle turn.	39.50 to	40.00
Cast iron borings	35.50 to	36.00
Mixed bor. & turn.	35.50 to	36.00
Low phos.	44.50 to	45.00
No. 1 machinery cast	73.00 to	76.00
Malleable	74.00 to	76.00
RR. cast.	73.00 to	74.00
Railroad grate bars	60.00 to	62.00
Stove plate	61.00 to	63.00
RR. hvy. melting	40.00 to	40.50
Rails 3 ft & under	60.00 to	61.00
Rails 18 in. & under	62.00 to	63.00

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	....	$25.00
No. 2 hvy. melting	....	25.00
No. 2 bales	....	25.00

Per gross ton delivered to consumer:

No. 3 bales	....	$19.50
Mach. shop turn.	....	16.00
Elec. furn. 1 ft under	$32.00 to	34.00
No. 1 cupola cast	40.00 to	43.00
RR. hvy. melting	....	26.00

LOS ANGELES

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	....	$25.00
No. 2 hvy. melting	....	25.00
No. 1 bales	....	25.00
No. 2 bales	....	25.00
No. 3 bales	....	19.00
Mach. shop turn.	....	17.50
No. 1 cupola cast.	$45.00 to	50.00
RR. hvy. melting	....	26.00

SEATTLE

Per gross ton delivered to consumer:

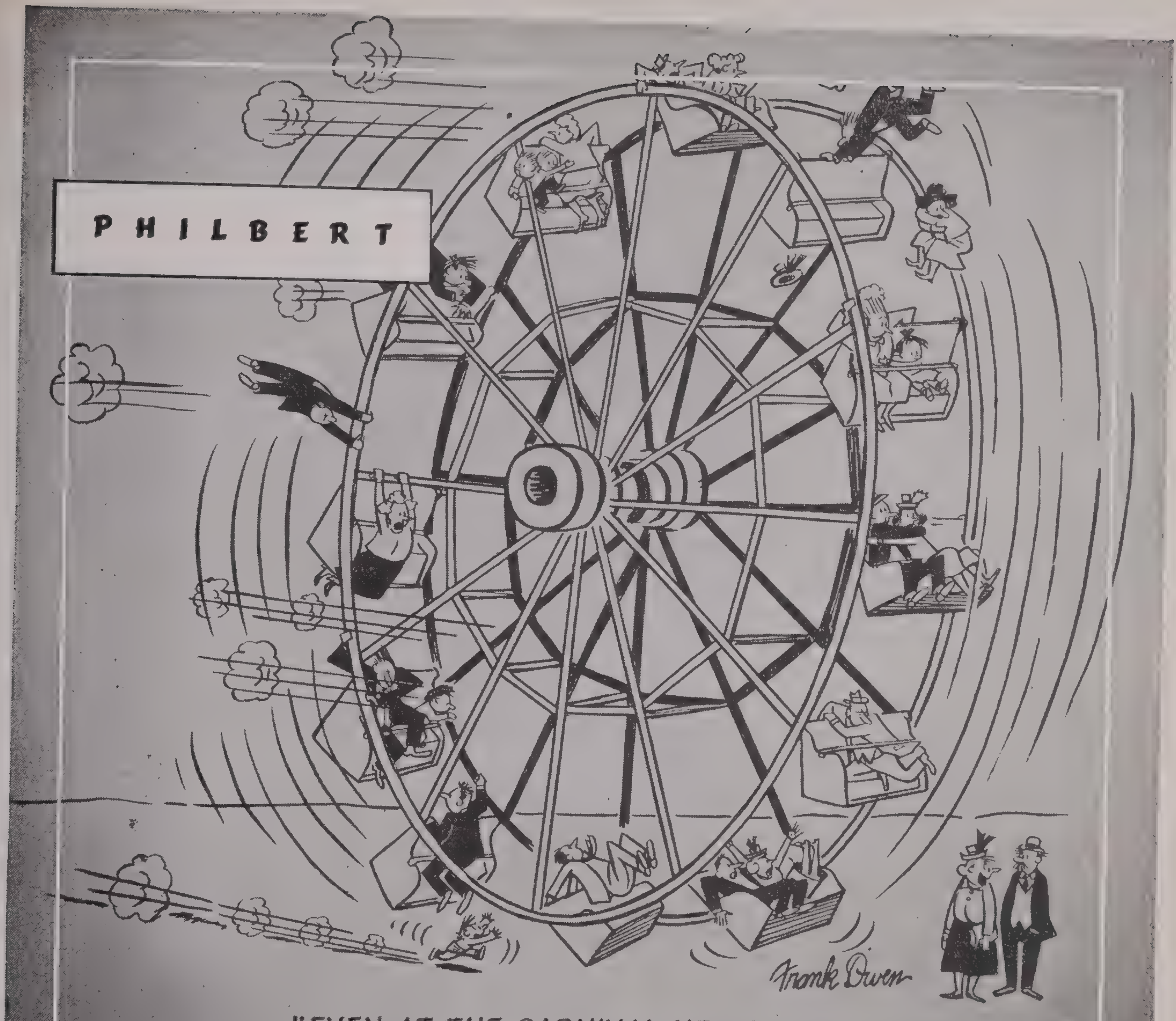
No. 1 & No. 2 hvy. melt.	....	$26.00
Elec. furn. 1 ft and under	....	30.00
No. 1 cupola cast	....	40.00
RR. hvy. melting	....	28.00

HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point.

Heavy melting		$22.00*
No. 1 bundles		22.00*
No. 2 bundles		21.50*
Mechanical bundles		20.00*
Mixed steel scrap		19.00*
Mixed borings and turnings		17.00*
Rails, remelting		23.00*
Rails, rerolling		26.00*
Bushelings		17.00*
Bushelings, new fact, prep'd		21.00*
Bushelings, new fact, unprep'd		16.00*
Short steel turnings		17.00*
No. 1 cast	$42.00 to	46.00
No. 2 cast	35.00 to	37.00

*Ceiling Price.



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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

NONFERROUS METALS

. . . News and Market Activities

Accelerated Strategic Stockpiling Program Undergoing Scrutiny

New York

• • • **The metals industry** was actively studying the implications of the accelerated strategic stockpiling program as revealed last week in the publication of the statement of Munitions Board Chairman Thomas Hargrave before the House Appropriations Committee in mid-January.

The formula for the acquisition of the strategic metals disclosed in the testimony should permit industry members to make reasonably accurate estimates of yearly stockpiling objectives, according to some observers.

According to Chairman Hargrave the tonnages were arrived at by a formula established by selecting the maximum use of each strategic material for the armed services and the civilian economy during the last war, and deducting the tonnage that would be reasonably available in the Western Hemisphere. This figure was apparently adjusted to take into consideration tonnages that might be required for a hypothetical war.

The period of acquisition was originally set at 5 years, although the statement contained nothing to indicate what modification of the period had been made in view of the acceleration of the program. The statement indicated that the program is subject to constant revision as to quantities and qualities of metals required in consideration of the development of new types of weapons, the development of substitute materials and the establishment of new sources of materials.

Industry members found confirmation of their fear that the strategic stockpiles, when acquired, would constitute a continuing threat to the stability of the metal markets in a portion of the Hargrave statement. He stated that the acquisition of these materials need not be considered purely as an expense, that if the success of the United Nations is such that war is unthinkable, these materials could be disposed of for at least as much as or more than the government is paying for them.

The Hargrave statement contained the following information of the effect of the accelerated rate of stockpiling:

"During the first 6 months of operations, that is, July to December, 1946, $35,000,000 were obligated. During the next 6 months, January to June, 1947, $46,000,000 were obligated. During the 6 months ending Dec 31, 1947, $103,000,000 were obligated. $22,000,000 additional have been obligated between Jan. 1 and Jan. 16, 1948.

"We have allowed ourselves a period of 5 years to accumulate stockpiles having a total value of $3,154,000,000. After allowance for the 12 pct acquired under Public Law 117 and from surplus property accretions, the remainder requires an annual procurement of about $550,000,000. Therefore, still further acceleration in procurement is necessary."

Aluminum Requirements For Defense Increasing

New York

• • • **Estimates of** requirements of aluminum for the rearmament program are constantly being revised upward by informed sources as new developments come to light. The most important prospective tonnage consumer uncovered to date would involve an estimated 90,000 tons of sheets a year for sheet metal barracks buildings now being designed. The use of aluminum for this application is contingent on the availability of steel for the purpose as optionable specifications are being prepared. Aluminum has already been adopted by the military for airborne arctic shelters and first aid units to replace canvas, but sheet tonnages involved are expected to be small. Aluminum will also be used for guided missle shells, but there is disagreement among procurement officers as to the importance of this weapon in future wars. Any estimates of consumption for this application would be subject to criticism.

These developments and others of a similar nature that have been disclosed to informed observers have caused them to recast their sights on the aluminum requirements of the rearmament program. Previous estimates based on the authorization of the 70-group airforce have ranged from 60 to 80 million lb per year. Now their estimates have risen sharply and some fantastic consumption figures have been mentioned.

ECA Authorizations

New York

• • • **According to a** responsible source of the total ECA authorizations for metals, ores and concentrates by June 15 reached $17,245,000. Nonferrous metals that are to come from the United States under the authorizations to date include brass sheet, strip and wire for Austria, $210,000; and zinc for the United Kingdom, $1.7 million. Metals that are to come out of Canada under the current authorizations include aluminum for Great Brittain, $10.6 million; copper for Great Britain, $1.5 million; lead for Great Britain, $1 mlilion; nickel for Austria, $35,000. In addition there is to be $373,200 worth of electrolytic copper for Austria purchased abroad.

Nonferrous Metals Prices

	June 16	June 17	June 18	June 19	June 21	June 22
Copper, electro, Conn.	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York	$1.03	$1.03	$1.03	$1.03	$1.03	$1.03
Zinc, East St. Louis	12.00	12.00	12.00	12.00	12.00	..12.00
Lead, St. Louis	17.30	17.30	17.30	17.30	17.30	17.30

Primary Metals

(Cents per lb. unless otherwise noted)

Aluminum, 99+%, 10,000 lb, f.o.b shipping point, freight allowed....	15.00
Aluminum pig, f.o.b. shipping point	14 00
Antimony, American, Laredo, Tex..	35.00
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be.......	$20.50
Beryllium aluminum 5% Be, dollars per lb contained Be................	$40.00
Cadmium, del'd	$1.75
Cobalt, 97-99% (per lb).....	$1.65 to $1.72
Copper electro, Conn. Valley.......	21.50
Copper, lake, Conn. Valley.........	21.625
Gold, U. S. Treas., dollars per oz...	$35.00
Indium. 99.8%. dollars per troy oz...	$2.25
Iridium, dollars per troy oz...	$110 to $120
Lead, St. Louis	17.30
Lead, New York	17.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots..........	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York...............	$75 to $77
Nickel, electro, f.o.b. New York....	36.56
Palladium. dollars per troy oz.......	$24.00
Platinum, dollars per troy oz....	$75 to $78
Silver, New York, cents per oz.....	74.625
Tin, Grade A, New York...........	$1.03
Zinc, East St. Louis................	12.00
Zinc, New York	12.65
Zirconium copper, 20 pct Zr, per lb contained Zr.	$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	19.00–19.25
No. 120	18.50–18.75
No. 123	18.00–18.25
80-10-10 ingot	
No. 305	25.25
No. 315	22.25
88-10-2 ingot	
No. 210	31.00
No. 215	29.00
No. 245	23.25–23.75
Yellow ingot	
No. 405	15.25–16.00
Manganese bronze	
No. 421	19.00

Aluminum Ingot

(Cents per lb. lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	22.00–22.50
0.60 copper, max.	22.00
Piston alloys (No. 122 type)...	20.00
No. 12 alum, (No. 2 grade)...	20.00
108 alloy	20.50
195 alloy	20.25
13 alloy	22.00
AXS-679	20.75

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95 pct.-95½ pct......	20.75–21.00
Grade 2—92 pct-95 pct.........	19.75–20.50
Grade 3—90 pct-92 pct.........	19.50–20.00
Grade 4—85 pct-90 pct.........	19.25–19.75

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer........	37⅝
Electrodeposited	32⅝
Rolled, oval, straight, delivered...	33.09
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer........	33⅝
Zinc, cast, 99 99	20.50
Nickel 99 pct plus, frt. allowed	
Cast	51
Rolled, depolarized	52
Silver 999 fine	
Rolled, 1000 oz lots per troy oz...	67¼

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum........	44.00
Copper sulfate, 99.5, crystals, bbls..	12.50
Nickel salts, single, 425 lb bbls. frt. allowed	15.50
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 96 pct domestic, 100 lb drums	15.00
Zinc cyanide, 100 lb drums..........	35.00
Zinc sulfate, 89 pct, granules, bbls, frt. allowed	7.90

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb., f.o.b. shipping point, freight allowed.)

Flat Sheet: 0.188 in., 2S, 3S, 24¢; 4S, 61S-O, 25.8¢; 52S, 27.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢. 0.081 in.; 2S, 3S, 25¢; 4S, 61S-O, 27.1¢; 52S, 29¢; 24S-O, 24S-OAL, 27.7¢; 75S-O, 75S-OAL, 34.3¢. 0.032 in.; 2S, 3S, 26.4¢; 4S, 61S-O, 30.1¢; 52S, 32.6¢; 24S-O, 24S-OAL, 34.2¢; 75S-O, 75S-OAL, 43.1¢.

Plate: ¼ in. and heavier; 2S, 3S, 21.2¢; 4S-F, 23.2¢; 52S, 24.2¢; 61S-O, 23.8¢; 24S-F,24S-FAL, 24.2¢; 75S, 75S-AL, 30.5¢.

Extruded Solid Shapes: Shape factors 1 to 4; 31¢ to 59¢; 11 to 13, 31.9¢ to 69c; 23 to 25, 33.4c to 90¢; 35 to 37, 40.8¢ to $1.25; 47 to 49, 58.7¢ to $1.84.

Extruded Round Rod, Square, Hex, Octagonal Bar: ¼ in. and over, 27¢ to 38¢; ½ to ¾ in., 28¢ to 40.5¢; ⅜ to ½ in., 29c to 43c; ¼ to ⅜ in., 30¢ to 46.5¢; 5/16 to 7/32 in., 32.5¢ to 53.5¢; 9/64 to 5/32 in., 35.5¢ to 62¢.

Rolled Rod: 1.064 to 4.5 in., 2S, 3S, 30¢ to 26.5¢; Cold-finished rod, 0.375 to 3.5 in., 2S, 3S, 32¢ to 28¢.

Screw Machine Stock: Drawn, ⅛ to 11/32 in., 11S-T3, R317-T4, 45¢ to 34¢; cold-finished, ⅜ to 1½ in., 11S-T3, 33¢ to 31¢; ⅜ to 2 in., R317-T4, 33¢ to 30¢; rolled, 1 9/16 to 3 in., 11S-T3, 31¢ to 28.5¢; 2⅛ to 3⅜ in., R317-T4, 29.5¢ to 28.5¢. Base 5000 lb.

Drawn Wire: coiled, 0.051 to 0.374 in.; 2S, 33¢ to 24¢ 52S, 40.5c to 29c; 56S, 42.5¢ to 34.5¢; 17S-T4, 46¢ to 31¢; 61S-T4, 41c to 30.5c; 75S-T6, 66¢ to 46¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58c-60c; 10, 59c-61c; 12, 63-65c; 14, 69c-74c; 16, 76c-81c; 18, 84c-89c 20, 96c-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher.

Extruded Round Rod: M, diam. in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢ 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 1.00 to 0.11 lb. per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16 $1.14; 5/16 to ⅜, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢. 0.065 to 0.082, ⅜ to 7/16, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢. 0.165 to 0.219, ⅝ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets		41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks		31

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Extruded Shapes	Rods	Sheets
Copper	33.53	....	33.68
Copper, hot-rolled	....	30.03	....
Copper, drawn ..	..	31.03	....
Low brass	34.36*	31.39	31.70
Yellow brass	32.92*	29.85	30.16
Red brass	34.89*	31.92	32.23
Naval brass	30.28	29.03	34.97
Leaded brass	28.64	24.69	....
Commercial bronze	35.68*	32.96	33.27
Manganese bronze	33.87	32.37	38.47
Phosphor bronze, 5 pct	53.95*	52.95	52.70
Muntz metal	29.80	28.55	32.99
Everdur, Herculoy, Olympic, etc. ..	37.24	37.50	38.56
Nickel silver, 10 pct.	41.80	42.68	40.54
5 pct	....	....	38.98
Architectural bronze	28.61	....	....

*Seamless tubing.

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1¢ per lb for shipments of 15,000 lb or more.)

	Heavy	Turnings
Copper	19⅛	18⅝
Yellow brass	15⅝	14¾
Red brass	17⅛	16¾
Commercial bronze	17⅝	16⅞
Manganese bronze	15¼	14⅝
Leaded brass rod ends....	15¾	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery.)

No. 1 copper, wire...........	18.50
No. 2 copper, wire...........	17.50
Light copper	16.50
Refinery brass	16.50–16.75*

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer.)

No. 1 copper, wire..............	18.50
No. 2 copper, wire..............	17.50
Light copper	16.50
No. 1 composition..............	14.50
No. 1 comp. turnings...........	14.00
Rolled brass	11.00
Brass pipe	11.25
Radiators	12.00
Heavy yellow brass.............	10.50
Aluminum	
Mixed old cast....................	11.50
Mixed old clips....................	11.50
Mixed turnings, dry	11.00
Pots & pans	12.00
Low copper	12.50

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Copper and Brass

No. 1 heavy copper and wire..	16½—17
No. 2 heavy copper and wire..	15½—16
Light copper	14¼—14¾
Auto radiators (unsweated)...	9¾—10¼
No. 1 composition	12½—13
No. 1 composition turnings.....	12 —12½
Clean red car boxes............	9½— 9¾
Cocks and faucets..............	9½—10
Mixed heavy yellow brass.....	8 — 8½
O'd rolled brass	9½— 9¾
Brass pipe	10 —10¼
New soft brass clippings......	12¼—12¾
Brass rod ends	10 —10½
No. 1 brass rod turnings.......	9½—10

Aluminum

Alum. pistons with struts.....	6½— 7
Aluminum crankcases	9¼— 9½
2S aluminum clippings	10½—11
Old sheet & utensils	9½—10
Dry borings and turnings.....	4 — 4½
Misc. cast aluminum	9 — 9½
Dural clips (24S)..............	9 — 9½

Zinc

New zinc clippings	8 — 8½
Old zinc	6 — 6½
Zinc routings	3 — 3½
Old die cast scrap.............	4 — 4½

Nickel and Monel

Pure nickel clippings	17 —18
Clean nickel turnings	13 —14
Nickel anodes	17 —18
Nickel rod ends	17 —18
New Monel clippings	12 —13
Clean Monel turnings	8 — 9
Old sheet Monel	10 —10½
Old Monel castings	7½— 8
Inconel clippings	9 —10
Nickel silver clippings, mixed	8 — 8½
Nickel silver turnings, mixed	6½— 7

Lead

Soft scrap lead	15½—16
Battery plates (dry)	9½— 9¾

Magnesium Alloys

Segregated solids	8 — 9
Castings	4½— 5½

Miscellaneous

Block tin	81 —83
No. 1 pewter	65 —67
No. 1 auto babbitt	50 —52
Miexed common babbitt	14¼—14¾
Solder joints	19 —19½
Siphon tops	50 —52
Small foundry type	17½—18
Monotype	16¼—16¾
Lino. and stereotype	15½—16
Electrotype	13½—14
New type shell cuttings......	14½—15
Hand picked type shells.......	6½— 7
Lino and stereo dross.........	8 — 8½
Electro dross	6 — 6½

Comparison of Prices . .

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Steel prices on this page are the average of various f.o.b. quotations of major basing points: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	June 22, 1948	June 15, 1948	May 25, 1948	June 24, 1947
Hot-rolled sheets	2.775	2.775	2.775	2.50
Cold-rolled sheets	3.495	3.495	3.495	3.20
Galvanized sheets (10 ga.)	3.913	3.913	3.913	3.55
Hot-rolled strip	2.775	2.775	2.775	2.50
Cold-rolled strip	3.535	3.535	3.535	3.20
Plates	2.93	2.93	2.93	2.65
Plates wrought iron	7.25	7.25	7.25	5.95
Stain's c-r strip (No. 302)	30.50	30.50	30.50	30.50
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$6.70	$6.70	$6.70	$5.75
Tinplate, electro (0.50 lb)	5.90	5.90	5.90	5.05
Special coated mfg. ternes	5.80	5.80	5.80	4.90
Bars and Shapes: (cents per pound)				
Merchant bars	2.875	2.875	2.875	2.60
Cold-finished bars	3.483	3.483	3.483	3.20
Alloy bars	3.213	3.213	3.213	3.05
Structural shapes	2.767	2.767	2.767	2.50
Stainless bars (No. 302)	26.00	26.00	26.00	26.00
Wrought iron bars	8.65	8.65	8.65	6.15
Wire: (cents per pound)				
Bright wire	3.608	3.608	3.608	3.30
Rails: (dollars per 100 lb)				
Heavy rails	$2.725	$2.725	$2.725	$2.50
Light rails	3.05	3.05	3.05	2.85
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$45.00†	$45.00†	$45.00†	$42.00
Slabs, rerolling	45.00†	45.00†	45.00†	42.00
Forging billets	54.00†	54.00†	54.00†	50.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	61.00
Wire Rods and Skelp: (cents per pound)				
Wire rods	3.133	3.133	3.133	2.55
Skelp	2.888	2.888	2.888	2.35

† Net ton

Pig Iron: (per gross ton)	June 22, 1948	June 15, 1948	May 25, 1948	June 24, 1947
No. 2, foundry, Phila.	$44.85	$44.85	$44.85	$36.51
No. 2, Valley furnace	39.50	39.50	39.50	33.50
No. 2, Southern Cin'ti.	45.47	45.47	45.47	34.75
No. 2, Birmingham	39.38	39.38	39.38	29.88
No. 2, foundry, Chicago†	39.00	39.00	39.00	33.00
Basic del'd Philadelphia	44.35	44.35	44.35	36.92
Basic, Valley furnace	39.00	39.00	39.00	33.00
Malleable, Chicago†	39.50	39.50	39.50	33.50
Malleable, Valley	39.50	39.50	39.50	33.50
Charcoal, Chicago	65.55	65.55	65.55	45.99
Ferromanganese‡	145.00	145.00	145.00	135.00

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† The switching charge for delivery to foundries in the Chicago district is $1 per ton.

‡ For carlots at seaboard.

* Revised.

Scrap: (per gross ton)	June 22, 1948	June 15, 1948	May 25, 1948	June 24, 1947
Heavy melt'g steel, P'gh.	$40.25	$40.25	$40.25	$35.75
Heavy mlt'g steel, Phila.	42.50	42.50	42.50	37.25
Heavy melt'g steel, Ch'go	39.25	39.25	39.25	31.25
No. 1, hy, comp. sh't, Det.	35.50	35.50	35.50	30.00
Low phos. Young'n	45.25	45.25	45.25	38.75
No. 1, cast, Pittsburgh	63.75	63.75	64.00	36.50
No. 1, cast, Philadelphia.	67.00	67.00	67.00	46.50
No. 1, cast, Chicago	69.50	69.50	71.50	43.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$12.75	$12.75	$12.50	$10.50
Foundry coke, prompt	16.50	16.50	14.00	11.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro. Conn.	21.50	21.50	21.50	21.50
Copper, Lake Conn.	21.625	21.625	21.625	21.625
Tin, Grade A, New York.	$1.03	$1.03	94.00	80.00
Zinc, East St. Louis	12.00	12.00	12.00	10.50
Lead, St. Louis	17.30	17.30	17.30	14.80
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	36.56	36.56	36.56	37.67
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	35.00	35.00	35.00	33.00

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

	FINISHED STEEL (Base Price)	PIG IRON	SCRAP STEEL
June 22, 1948	3.24473¢ per lb.	$40.53 per gross ton	$40.66 per gross ton
One week ago	3.24473¢ per lb.	$40.53 per gross ton	$40.66 per gross ton
One month ago	3.24473¢ per lb.	$40.53 per gross ton	$40.66 per gross ton
One year ago	2.85664¢ per lb.	$33.15 per gross ton	$34.75 per gross ton

	Finished Steel HIGH	Finished Steel LOW	Pig Iron HIGH	Pig Iron LOW	Scrap Steel HIGH	Scrap Steel LOW
1948	3.27585¢ Feb. 17	3.22566¢ Jan. 1	$40.53 May 18	$39.58 Jan. 6	$41.83 Jan. 29	$39.75 Mar. 9
1947	3.19541¢ Oct. 7	2.87118¢ Jan. 7	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue

Based on averages for basic iron at valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound unless otherwise indicated. Extras apply. Delivered prices are minimum and do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 0.25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) 18 gage and heavier. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb & over. (9) Carload lot in manufacturing trade. (10) Arbitrary delivered prices. (11) Hollowware enameling, gages 29 to 31 only. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only. (14) Kaiser Co. prices (15) from 0.035 to 0.075 in. thick by ¾ to 3½ in. wide. (16) Deliverd Los Angeles; add 0.55¢ per 100 lb for San Francisco. (17) Slab prices subject to negotiation in most cases. (18) 24 to 14 gage, up to 48 in.; 26 gage, up to 42 in.; 30 to 27 gage, up to 36 in.

PRODUCTS	Prices at basing points apply only to the sizes and grades produced at those points.												DELIVERED TO		
	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		San Francisco, Los Angeles	Detroit[10]	New York	Philadelphia
INGOTS Carbon forging	$46.00	Rerolling ingots—$36.00 per net ton f.o.b. mill (Spot market as $75 to $90 per gross ton)													
Alloy	$56.00										Canton = $56.00				
BILLETS, BLOOMS, SLABS Carbon, rerolling[17]	$45.00	$45.00	$45.00	$47.00	$45.00	$45.00		$45.00							
Carbon forging billets	$54.00	$54.00	$54.00	$54.00	$54.00	$54.00	(per net ton)								
Alloy	$66.00	$66.00				(Bethlehem, Massillon, Canton = $66.00)									
PIPE SKELP	2.85 to 2.90						2.90								
WIRE RODS	2.80 to 3.55	2.80 to 3.80		2.80 to 3.05	2.85						Worcester = 2.90	3.5245[13]			
SHEETS Hot-rolled[6]	2.75 to 2.80	2.75 to 2.80	2.75	2.80	2.75 to 2.80	2.80	2.75 to 2.80	2.80		Ashland, Ky. = 2.80		3.494[16] to 3.6875	2.96 to 3.01	3.18 to 3.31	3.06 to 3.24
Cold-rolled[1]	3.45 to 3.50	3.45 to 3.55	3.45	3.50		3.55	3.55	3.55[18]	3.65	3.50			3.66	3.93 to 4.01	3.81 to 3.94
Galvanized (10 gage)	3.85	3.95	3.85 to 3.95		3.85 to 3.95		3.95	3.95	4.0	3.95	Ashland = 3.95	4.624[16]		4.33	4.21
Enameling (12 gage)	3.85	3.75	3.75 to 3.85	3.95			3.95		4.05	3.85			4.11 to 4.16	4.41	4.34
Long ternes[2] (10 gage)	4.05		4.05											4.61	4.54
STRIP Hot-rolled[3]	2.80	2.75 to 2.80	2.75	2.75 to 2.80	2.75		2.75 to 2.80					3.554[16] to 3.9125	2.96 to 3.01	3.36	3.29
Cold-rolled[4]	3.50	3.55 to 3.65	3.55	3.45 to 3.50			3.55			Worcester = 3.65 to 3.75			3.66	4.06	3.99
TINPLATE Cokes, 1.50 lb,[5] base box	6.70	6.70	6.70		6.80			6.80	6.90	(Warren, Ohio = $6.80)				7.18	7.06
Electrolytic 0.25, 0.50, 0.75 lb, box	Deduct $1.00, 80¢ and 60¢ respectively from 1.50 lb coke base box price.														
TERNES, MFG., special coated	Deduct 90¢ from 1.50 lb coke base box price.														
BLACKPLATE, CANMAKING 55-70 lb, 75-95 lb, 100-128 lb	Deduct $1.60, $1.70 and $1.60 respectively from 1.50 lb coke base box price.														
BLACKPLATE, h.e., 29 ga.[11]	4.65	4.65	4.65					4.75	4.85					5.13	5.01
BARS Carbon Steel	2.85 to 2.90	2.85 to 2.90	2.85	2.90	2.85 to 2.90	2.90	2.85 to 2.90					3.579[16] to 3.629[16]	3.06 to 3.11	3.40	3.34
Reinforcing (billet)[7]	2.70 to 2.80	2.70 to 2.80	2.70		2.70		2.70	2.75				3.325[16]		3.13	3.01
Cold-finished[8]	3.45 to 3.55	3.45 to 3.55		3.45									3.60 to 3.76	4.01	3.94
Alloy, hot-rolled	3.20	3.20 to 3.30	3.20			3.30	3.20	Bethlehem, Massillon, Canton = 3.30						3.56	3.48
Alloy, cold-drawn	4.00 to 4.10	4.00 to 4.10		4.00		4.10		Massillon, Canton = 4.10						4.56	4.49
PLATE Carbon steel[12]	2.90 to 2.95	2.90 to 2.95	2.90 to 2.95	2.95	2.85 to 2.90		2.90 to 2.95	Coatesville = 3.45, Claymont = 3.65 2.95 Geneva, Utah = 2.90				3.8375[14]		3.33	3.21
Floor plates	4.05	3.95 to 4.05	3.95	4.05										4.61	4.54
Alloy	3.70	3.70	3.70						Coatesville = 4.80					4.28	4.19
SHAPES, Structural	2.75	2.75 to 2.80	2.75 to 2.80		2.75		Bethlehem = 2.80, Geneva, Utah = 2.75					3.424[16] to 3.49		3.06	2.98
MANUFACTURERS' WIRE[9] Bright	3.45 to 3.80	3.45 to 4.05		3.45	3.45 to 3.55					Worcester = 3.55 Duluth = 3.50		4.4645[13]		3.95	3.94
Spring (high carbon)	4.50	4.50		4.50					Worcester = 4.60 Trenton, Duluth = 4.75			5.5345[13]		5.00	4.99
PILING, Steel sheet	3.30	3.30				3.30								3.83	3.79

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

	Chromium Nickel		Straight Chromium			
Basing Point	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville, Beth, Brackenridge	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton, Brackenridge, Balt, Coatesville	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt, Brackenridge	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	26.00	38.00
Strip, c-r, P'gh, Cleve, Jersey City, Reading, Canton, Youngstown, Balt, W. Leechburg	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton, W. Leechburg	32.46	30.30	23.80	24.34	34.82	56.26
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	28.75
Tubing, seamless, P'gh, Chi, Canton, Brackenridge, Milwaukee	72.09	72.09	....	68.49	....	....

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	14.00¢
8 to 16	48, 60, 72	14.50¢
7	48, 60	15.75¢
6	48, 60	17.00¢
4, 5	40	17.50¢
3	40	18.50¢
2½	24, 30	19.00¢
2	24, 30	21.00¢
Carbon		
40	100, 110	6.75¢
35	65, 110	6.75¢
30	65, 84, 110	6.75¢
24	72 to 104	6.75¢
17 to 20	84, 90	6.75¢
14	60, 72	7.25¢
10, 12	60	7.50¢
8	60	7.75¢

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)*

W	*Cr*	*V*	*Mo*	*Co*	*Base per lb*
18	4	1	—	—	82¢
18	4	1	—	5	$1.29
18	4	2	—	—	93¢
1.5	4	1.5	8	—	59¢
6	4	2	6	—	63¢
High-carbon-chromium*					47¢
Oil hardening manganese*					26¢
Special carbon*					24¢
Extra carbon*					20¢
Regular carbon*					17¢

Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi, 4¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Armature	4.70¢ to 5.05¢
Electrical	5.20¢ to 5.45¢
Motor	5.95¢ to 6.30¢
Dynamo	6.65¢ to 7.50¢
Transformer 72	7.15¢ to 8.25¢
Transformer 65	7.85¢ to 9.20¢
Transformer 58	8.55¢ to 9.90¢
Transformer 52	9.35¢ to 9.70¢

F.o.b. Chicago and Gary: armature through motor only. F.o.b. Granite City add to lower quotation 0.55¢ for armature through and including 72, and 0.45¢ for balance.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, 100 lb and heavier, No. 1 O.H., per 100 lb	$2.70 to$2.75*
Joint bars, 100 lb	3.75
Light rails (from billets) per 100 lb.	3.05

* CF&I charges $3.05.

	Base per lb
Cut spikes	4.85¢
Screw spikes	6.90¢
Tie plate, steel	3.55¢
Tie plates, Pittsburg, Calif	3.70¢
Track bolts	7.00¢
Track bolts, heat treated, to railroads	7.25¢

C-R SPRING STEEL

Base per pound f.o.b. Pittsburgh, Cleveland

0.08 to 0.40 carbon	3.45¢
0.41 to 0.60 carbon	4.95¢
0.61 to 0.80 carbon	5.55¢
0.81 to 1.05 carbon	7.05¢
1.06 to 1.35 carbon	9.35¢

Worcester, add 0.20¢

CLAD STEEL

Base prices, cents per pound

Stainless-clad	*Plate*	*Sheet*
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00	*22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	21.50	....
Inconel-clad		
10 pct, f.o.b. Coatesville	30.00	....
Monel-clad		
10 pct, f.o.b. Coatesville	24.00	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

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* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. Pittsburgh, Chicago, Birmingham

	Base Column	*San Francisco*
Standard & coated nails*	91	112
Galvanized nails*	91	112
Woven wire fence†	97	120
Fence posts, carloads††	104	...
Single loop bale ties	94	118
Galvanized barbed wire**	111	131
Twisted barbless wire	111	...

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* Also Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. ** On 80-rod spools, in carloads. †† Duluth only.

	Base per 100 lb	*San Francisco*
Annealed fence wire‡	$4.10	$5.1145
Annealed, galv. fencing‡	4.55	5.5645
Cut nails, carloads‡‡	6.15	...

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‡ Add 10¢ at Worcester. ‡‡ Wheeling only, Pittsburgh add 15¢ (less 20¢ to jobbers).

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Alde-cor	Corten	Double Strength No. 1	Dyn-alloy	Hi Steel	Mayari R	Otis-coloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	4.55	4.45	4.55	4.55	4.45	4.55	4.45	4.55	4.55
Sheets									
Hot-rolled	4.30	4.20	4.30	4.50	4.20	4.30	4.20	4.30	4.30
Cold-rolled	5.30	5.20	5.30	....	5.20	5.30	5.20	5.30	5.30
Galvanized	.	5.90	....	....	5.90	6.00	....	....	....
Strip									
Hot-rolled	4.30	4.20	4.30	....	4.20	4.30	4.20	4.30	4.30
Cold-rolled	....	....	5.30	....	....	5.30	5.30	5.30	5.30†
Shapes	....	4.20	.	....	4.20	4.30	4.20	4.30	....
Beams	....	4.20	....	....	4.20	4.30	....	....	....
Bars									
Hot-rolled	4.45	4.35	4.45	....	4.35	4.45	4.35	4.45	4.45
Bar shapes	....	4.35	....	....	4.35	4.45	4.35	4.45	....

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh and Lorain, steel buttweld and seamless. Others f.o.b. Pittsburgh only

Base price, $200.00 per net ton

One producer allows 1 point less discount on steel buttweld.

Standard, threaded & coupled

	Black	*Galv.*
Steel, buttweld		
½-in.	48	30½
¾-in.	51	34½
1-in.	53½	37½
1¼-in.	54	38
1½-in.	54½	38½
2-in.	55	39
2½ and 3-in.	55½	39½
Wrought Iron, buttweld		
½-in.	+11	+35
¾-in.	+ 1½	+25
1 and 1¼-in.	4	+16½
1½-in.	9½	+13
2-in.	10	+12½
Steel, lapweld		
2-in.	44½	28
2½ and 3-in.	48½	32
3½ to 6-in.	50½	34
Steel, seamless		
2-in.	43½	27
2½ and 3-in.	46½	30
3½ to 6-in.	48½	32
Wrought Iron, lapweld		
2-in.	1½	+20
2½ to 3½-in.	4	+16
4-in.	8	+10½
4½ to 8-in.	6	+12

Extra Strong, plain ends

Steel, buttweld		
½-in.	46	30
¾-in.	50	34
1-in.	52	37
1¼-in.	52½	37½
1½-in.	53	38
2-in.	53½	38½
2½ and 3-in.	54	39
Wrought Iron, buttweld		
½-in.	+ 6½	+29
¾-in.	+ ½	+23
1 and 1¼ in.	4	+16½
2-in.	10	+12½
Steel, lapweld		
2-in.	43½	28
2½ and 3-in.	48½	33
3½ to 6-in.	52	36½
Steel, seamless		
2-in.	42½	27
2½ and 3-in.	46½	31
3½ and 6-in.	50	34½
Wrought Iron, lapweld		
2-in.	4½	+16½
2½ to 4-in.	13	+ 6
4½ to 6-in.	9	+10½

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point ower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. hipments, prices are determined by adding 25 pct and 30 pct and the carload reight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 t, f.o.b. Pittsburgh in carload lots, out ength 4 to 24 ft. inclusive.

		Seamless*		Electric Weld	
OD in.	Gage BWG	Hot-Rolled	Cold-Drawn	Hot-Rolled	Cold-Drawn
2	13	$17.84	$20.99	$17.30	$20.36
2½	12	23.99	28.21	23.27	27.36
3	12	26.68	31.40	25.88	30.46
3½	11	33.35	39.26	32.35	38.08
4	10	41 40	48.70	40.16	47.24

One company charges approx. 2 pct less.

CAST IRON WATER PIPE

	Per net ton
-in to 24-in., del'd Chicago	$98.70
-in. to 24-in., del'd New York	95.50
-in. to 24-in., Birmingham	85.50
-in and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	112.30

Class 'A'' and gas pipe, $5 extra; 4-in. ipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Percent Off List
½ in. & smaller x 6 in. & shorter	45
9/16 & ⅝ in. x 6 in. & shorter	46
¾ in. & larger x 6 in. & shorter	43
All diam, longer than 6 in.	41
Lag, all diam over 6 in. long	44
Lag, all diam x 6 in. & shorter	46
Plow bolts	54

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	43
9/16 to 1 in. inclusive	42
1⅛ to 1½ in. inclusive	40
1⅝ in. and larger	35

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	USS	SAE
7/16 in. and smaller	..	46
½ in. and smaller	44	..
½ in. through 1 in.	..	44
9/16 in. through 1 in.	43	..
1⅛ in. through 1½ in.	41	42
1⅝ in. and larger	35	..

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

Packages, nuts separate	65 and 10
In bulk	75

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets (*½ in. and larger*)

	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$5.65
F.o.b. Lebanon, Pa.	5.80

Small Rivets (*7/16 in. and smaller*)

	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	55

Cap and Set Screws

(In packages)	*Percent Off List*
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	53
¾ to 1 in. x 6 in., SAE 1035, heat treated	44
Set screws, oval points	57
Milled studs	29
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	37

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF_2 Content:	*Base price per short ton*
70% or more	$35.00
65% but less than 70%	34.00
60% but less than 65%	33.00
Less than 60%	32.00

LAKE SUPERIOR ORES

(51.50% *Fe, Natural Content, Delivered Lower Lake Ports*)

	Per Gross Ton
Old range, bessemer	$6.60
Old range, nonbessemer	6.45
Mesabi, bessemer	6.35
Mesabi, nonbessemer	6.20
High phosphorus	6.20

Increases or decreases in freight rates, dock handling charges and taxes after Apr. 1, 1948, are to be added to above prices.

METAL POWDER

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.9¢ to 9.0¢
Domestic sponge iron, 98+% Fe	9.5¢ to 16.0¢
Electrolytic iron, annealed, 99.5+% Fe	19.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe.	44.0¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, minus 300 mesh, 98%, 99.8+% Fe	90.0¢ to $1.75
Aluminum	23.0¢
Antimony	46.0¢
Brass	24.0¢ to 28.5¢
Copper, electrolytic	30.625¢
Copper, reduced	30.5¢
Cadmium	$2.40
Chromium, electrolytic, 99% min.	$3.50
Lead	24.0¢
Manganese	50.0¢
Molybdenum, 99%	$2.65
Nickel, unannealed	51.5¢
Nickel, spherical, minus 30 mesh	53.0¢
Silicon	29.0¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.0¢
Tin	$1.11
Tungsten, 98%, 99%	$2.90

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$12.00 to $13.50
Foundry beehive (f.o.b. oven) Connellsville, Pa.	16.00 to 17.00
Foundry, Byproduct	
Chicago, del'd	$18.60
Chicago, f.o.b.	17.60
Detroit, f.o.b.	18.50
New England, del'd	21.75
Seaboard, N. J., f.o.b.	20.50
Philadelphia, f.o.b.	19.50
Swedeland, Pa., f.o.b.	19.50
Ashland, Ohio, f.o.b.	18.25
Painesville, Ohio, f.o.b.	19.45
Erie, del'd	19.90
Cleveland, del'd	17.90
Cincinnati, del'd	18.59
St. Louis, del'd	18.03
Birminham, del'd	16.71

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

	Carloads, Per 1000
No. 1 Ohio	$67.00
First quality, Pa., Md., Ky., Mo., Ohio	73.00
First quality, New Jersey	78.00
Sec. quality, Pa., Md., Ky., Mo., Ohio	67.00
Sec. quality, New Jersey	70.00
No. 2 Ohio	59.00
Ground fire clay, net ton, bulk	10.50

Silica Brick

Pennsylvania and Birmingham	$73.00
Chicago District and Alabama	82.00
Silica cement, net ton (Eastern)	12.50
East Chicago	13.50

Chrome Brick

	Per Net Ton
Standard chemically bonded, Balt., Plymouth Meeting, Chester	$64.00

Magnesite Brick

Standard, Balt. and Chester	$86.00
Chemically bonded, Baltimore	75.00

Grain Magnesite

std. ¾-in. grains

Domestic, f.o.b. Balt. and Chester in bulk, fines removed	$51.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	27.00
in sacks with fines	31.50

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk. Midwest, add 10¢; Missouri Valley, add 20¢	$11 05

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	$4.45-4.97	$5.66-5.81	$5.90-5.92	$4.85-5.36	$5.98-6.55	$4.87	$4.58	$4.91	$5.65-5.73	$8.50-8.65	$8.80	$10.38	$10.53
New York	4.74-4.79	5.70[1]-5.95[1]	6.19	5.08-5.58	6.05-6.30	5.09-5.14	4.77-4.82	5.05-5.08	5.78	8.58-8.73	8.73-8.88	10.23-10.43	10.43-10.58
Boston	4.88	5.74	6.28	5.64	6.90	5.23	4.94	5.09	5.96	9.05	9.20	10.51	10.66
Baltimore	4.27	....	5.62	4.79	....	4.72	4.69	4.84	5.66	....	....	.....	.....
Norfolk	4.90	....	....	5.30	....	5.15	5.15	5.20	6.00	....	....	.....	.....
Chicago	4.20	5.00	5.88	4.35	5.35-6.65	4.55	4.35	4.35	5.00-5.10	8.20	8.35	9.50	9.65
Milwaukee	4.42	5.22	5.87	5.02	5.57	4.77	4.57	4.57	5.334	8.534	8.684	9.784	9.984
Cleveland	4.20	5.00[1]	5.74	4.52	5.95	4.55†	4.67	4.35	5.00-5.10	8.64	8.79	9.50	9.65
Buffalo	4.25	5.15	6.06	5.26	5.72	4.96	4.40‡	4.40‡	5.10	8.20	8.35	9.50	9.65
Detroit	4.60	5.45	6.07	4.80	5.70	4.90†	4.80	4.50	5.16	8.72-8.87	8.87-9.02	9.94-10.17	10.14-10.32
Cincinnati	4.59	5.22	5.57	4.80	....	4.96	4.80	4.76	5.59	8.85	9.00	10.16	10.31
St. Louis	4.59	5.39	6.17-6.27	4.69-5.24	5.97	4.89-4.94	4.74	4.74	5.62	8.82	8.97	10.07	10.27
Pittsburgh	4.20-4.25	5.10[1]	5.65	4.30-4.35	....	4.55	4.35	4.35	5.00	8.20	8.35	9.50	9.65
St. Paul	4.68	5.53	6.08	4.78	....	5.03	4.83	4.83	6.00	....	....	.....	.....
Omaha	5.31	....	6.76	5.41	....	5.66	5.41	5.46	6.06	....	....	.....	.....
Indianapolis	4.52	5.31	5.96	4.62	5.72-5.87	4.87	4.67	4.67	5.52	....	....	9.97	10.17
Birmingham	4.45[11]	....	5.80	4.45[11]	....	4.65[11]	4.40[11]	4.40[11]	6.13	....	....	.....	.....
Memphis	4.91[11]	5.98[1]	5.08[11]	5.11[11]	5.23[11]	5.21[11]	5.01[11]	5.01[11]	5.50	....	....	.....	.....
New Orleans	*5.08[11]	6.44[1]	....	5.28[11]	....	5.38[11]	*5.10[11]	*5.18[11]	6.34[6]	....	....	.....	.....
Houston	5.55	....	7.21	5.65	....	5.90	5.70	5.70	7.00	9.40	9.25	10.40	10.55
Los Angeles	5.70	7.25[1]	7.30	6.00	8.60[5]	5.35	5.15**	5.45	7.25[14]-7.35[14]	9.55[15]	9.40[15]	10.95[15]	11.15[15]
San Francisco	5.35[8]	6.55-7.25	7.05-7.45	5.70[8]	8.60	5.30	5.10**	5.00	7.40	9.55[15]	9.40[15]	10.95[15]	11.15[15]
Seattle	5.45[4]	7.25[2]	7.10[2]	6.15[4]	....	5.60[4]	5.30[4]	5.65[4]	7.35[14]-7.45[14]	8.70[15]	9.70[15]	.....	11.30[15]
Portland	7.70[4]	7.25[2]	7.10	5.85[4]	....	5.70[4]	5.40[4]	5.65[4]	7.45[14]	....	8.95[6]	.....	11.30[15]
Salt Lake City	6.40	....	7.85	6.70	....	6.00	6.25	6.56	7.55	....	....	.....	.....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb.

* Add 46¢ for sizes not rolled in Birmingham.

† Up to ¾ in. thick and 90 in. wide.

‡ Add 41¢ for sizes not rolled at Buffalo.

** Add 15¢ for sizes not rolled at Geneva.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

BASING POINT* PRICES

Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	40.00	40.50	41.00	41.50	.....
Birmingham	38.88	39.38	.....	.....	.....
Buffalo	40.00-42.38*	40.00-42.88*	40.50 43.38*	.....	.....
Chicago	38.50	39.00	39.50	40.00	.....
Cleveland	38.50-39.75*	39.00-40.25*	39.50-40.75*	.....	.....
Duluth	39.00	39.50	40.00	40.50	.....
Erie	38.50	39.00	39.50	40.00	.....
Everett		45.00	45.50	.....	.....
Granite City	45.25	45.75	46.25	.....	.....
Neville Island	42.00	42.50	42.50	43.00	.....
Provo	39.00	39.50	.....	.....	.....
Sharpsville	39.00	39.50	39.50	40.00	.....
Steelton	40.00	.....	.....	.....	46.00
Struthers, Ohio	42.50	.....	.....	.....	.....
Swedeland	45.00	45.50	46.00	46.50	.....
Toledo	38.50	39.00	39.50	40.00	.....
Troy, N. Y.	.....	.....	.....	.....	46.00
Youngstown	39.00	39.50	39.50	40.00	.....

DELIVERED PRICES† (BASE GRADES)

Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	45.50	46.00	.....	.....
Boston	Steelton	6.27	46.27	.....	.....	.....	52.27
Brooklyn	Bethlehem	3.90	43.90	44.40	44.90	45.40	.....
Cincinnati	Birmingham	6.09	44.97	45.47	.....	.....	.....
Jersey City	Bethlehem	2.39	42.39	42.89	43.39	43.89	.....
Los Angeles	Provo	6.93	45.93	44.43	.....	.....	.....
Mansfield	Cleveland-Toledo	3.03	41.53-42.78*	42.03-43.28*	42.53 43.78*	.....	.....
Philadelphia	Bethlehem	2.17	42.17	42.67	43.17	43.67	.....
Philadelphia	Swedeland	1.31	46.31	46.81	47.31	47.81	.....
Philadelphia	Steelton	2.81	42.81	.....	.....	.....	48.81
San Francisco	Provo	6.93	45.93	46.43	.....	.....	.....
Seattle	Provo	6.93	45.93	46.43	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	46.00	46.50	47.00	.....	.....

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* Republic Steel Corp. price. Basis: pig iron at Cleveland and Buffalo set by average price of No. 1 hvy. mlt. steel scrap at Cleveland or Buffalo respectively as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Basing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio—$53.50; f.o.b. Buffalo—$50.75. Add $1.25 per ton for each additional 0.50 pct Si. up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $58.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $65.55. High phosphorus charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Phila., New York, Birmingham.

Carload lots (bulk)	$145
F.o.b. Rockwood, Tenn.	$150
Less ton lots (packed)	185.00
Delivered Pittsburgh	151.00

$1.80 for each 1% above 82% Mn; penalty, $1.80 for each 1% below 78%.

Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	8.70	8.95	9.50
Ton lots	10.30	10.90	12.80
Less ton lots	11.20	11.80	13.70

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$51.00	$52.00
F.o.b. Pittsburgh.	50.00	51.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	32
L.c.l. lots	34

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.07% max. C. 0.06% P, 90% Mn.	23.00	24.85	26.05
0.10% max. C.	22.50	24.35	25.55
0.15% max. C.	22.00	23.85	25.05
0.30% max. C.	21.50	23.35	24.55
0.50% max. C.	21.00	22.85	24.05
0.75% max. C., 7.00% max. Si.	18.00	19.85	21.05

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload bulk	7.80
Ton lots	9.45
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet	8.75
Ton lots	10.35
Less ton lots	11.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, openhearth $78.00, foundry, $79.00; $78.75 f.o.b. Niagara Falls; $77.50 f.o.b. Jackson, Ohio. Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 per ton for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
96% Si, 2% Fe.	16.90	17.50	18.10
97% Si, 1% Fe.	17.30	17.90	18.50

Silicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb Si briquets.

	Eastern	Central	Western
Carload, bulk	5.25	5.50	5.70
Ton lots	6.85	7.45	7.75
Less ton lots	7.75	8.35	8.65

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
25% Si	16.50	....	....
50% Si	9.30	9.80	10.00
75% Si	11.80	12.10	12.85
85% Si	13.30	13.60	14.35
90% Si	15.00	15.30	16.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast	Turnings	Distilled
Ton lots	$1.85	$2.70	$3.40
Less ton lots	2.20	3.05	4.20

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	26.50	26.90	27.00
0.10% C	26.00	26.40	26.50
0.15% C	25.50	25.90	26.00
0.20% C	25.25	25.65	25.75
0.50% C	25.00	25.40	25.50
1.00% C	24.50	24.90	24.75
2.00% C	24.25	24.65	24.75
65-69% Cr, 4-9% C	18.60	19.00	19.15
62-66% Cr. 4-6% C. 6-9% Si.	19.45	19.85	20.00

Briquets — Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	12.50	12.75	12.85
Ton lots	14.00	14.90	15.50
Less ton lots	14.90	15.80	16.40

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	19.70	20.10	20.25
Ton lots	21.85	23.15	23.95
Less ton lots	23.35	24.65	25.45

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% mn, 1.25% max. C.

	Eastern	Central	Western
Carload	25.00	25.40	25.50
Ton lots	27.30	27.95	29.15
Less ton lots	29.10	29.75	30.95

Chromium Metal

Contract prices, cents per lb, chromium contained carload packed, f.o.b. shipping point freight allowed, 97% min. Cr. 1% max. Fe.

	Eastern	Central	Western
0.20% max. C.	97.00	98.50	99.75
0.50% max. C.	93.00	94.50	95.75
9.00% min. C.	91.50	93.00	94.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	16.25	16.75	18.80
Ton lots	19.35	20.10	22.25
Less ton lots	20.85	21.60	23.75

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	17.50	18.00	20.05
Ton lots	19.80	20.65	22.40
Less ton lots	20.80	21.65	23.40

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si. 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-500% C.

	Eastern	Central	Western
Ton lots	18.00	19.10	21.05
Less ton lots	19.25	20.35	22.30

V Foundry Alloys

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn. V-7: 28-32% Cr, 15-21% Si, 14-16% Mn.

Ton lots	14.60¢
Less ton lots	15.85¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed. Si 56%, Ti 9% Ca 5%.

Ton lots	17.90¢
Less ton lots	19.40¢

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn. 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	15.75	16.85	18.80
Less ton lots	17.00	18.10	20.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained W, 5 ton lots, freight allowed	$2.25
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2O_5	$1.20
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb	
Ton lots	$2.50
Less ton lots	$2.55
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	95¢
Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	80¢
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo.	80¢
Molybdenum oxide in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo.	80¢
Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti	$1.23
Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti	$1.35
Less ton lots	$1.40
High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton	$152.50
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
Less ton lots	$1.25
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	18.40¢
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy	
Carload, bulk	6.00¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.20¢
Ton lots	7.70¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Car lots	9.50¢
Ton lots	10.25¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
	$1.20	$1.23	$1.21

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

	Eastern	Central	Western
Ton lots	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.044

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

	Eastern	Central	Western
Less ton lots	$1.80	$1.8125	$1.8445

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.	
Carload lots	39.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b., Suspension Bridge, N. Y., freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3%-4%, Si 40%-45%, per lb contained B	$6.25

MAPI Meet

(CONTINUED FROM PAGE 127)

ment. Since many such projects require time to yield a return on the investment, they cannot be loaded with periodic debt charges of a loan. To do so would invite default on the loan and impairment of the country to expand industrially. Also, equity investment tends to keep investments in the country.

The bank cannot interfere politically with any country, but can decide only on economic conditions. However, political conditions have to be considered from the standpoint of repayment of the loan.

Capital goods exports can help develop resources of a country, and South American countries, as a group, are wealthy in natural resources. These have been undeveloped and will take American aid to develop. However, Mr. MacLaine warned against too rapid development of industrial projects, since these countries may not be able yet to absorb them economically. The International Bank has not yet made any loans to private enterprise unless the loan to the Chilean government, which was subsequently reloaned to private enterprise, is considered. However, several such loans are under negotiation. To date, United States and Belgium have supplied the only loanable funds in the bank, and since the first of this year the bank has been operating at a profit.

* * *

James Y. Scott, president of Van Norman Co., who has just returned from a tour of England's industrial plants, spoke of the "Market in England." His feeling is that England offers no market for American capital goods except those which the English do not build, and England's present policies of export make it necessary for America to guard its world markets. England is more export minded than at any time in its history, nad the tendency of English manufacturers to adopt in-line production is strong. He stated that in visiting many English plants, production lines were being rebuilt to take advantage of in-line production to boost not only production but quality.

* * *

Thomas J. Hargrave, chairman of the Munitions Board, spoke of the "Activities of the Munitions Board." With the organization of the three military services into one department, a coordinated procurement system was developed. A manual was set up to allocate work and services to some 22,000 American plants. One procurement officer in a plant will handle material for all three services, and the volume of production required of a given plant will be determined by the needs as set up by the Joint Chiefs of Staff and their strategic military policy, subject to review by the Munitions Board. All types of procurement will be coordinated, and by Aug. 1, 1948 uniform procurement regulations will be established, including contracts, terms, terminations, and provision. These will be the same for all branches of the military. It is likewise hoped that this will reduce costs and speed production in case of an emergency.

* * *

C. A. Packard, vice-president and comptroller of the Worthington Pump and Machinery Corp., and chairman of the MAPI accounting council subcommittee on contract cost principles, discussed the objections to the statement of principles that are being devised for determining costs on Government contracts. He presented the view that the Government's ideas of what constitutes applicable costs on commercial business likewise should afford the basis for determining costs on Government business. Under the proposed statement of new principles on costs, he stated that selling and distribution costs other than those incidental to the performance of the contract were disallowed. These include commissions of all types; royalties and license fees paid to people associated largely with the company operation; advertising; contributions to charities; expenses in transfers of capital stocks and bonds; collection expenses; and interest on borrowed capital. Also, the Government claims the benefits of cash discounts even though a manufacturer cannot take them. Instead of using the Internal Revenue Code as a basis for allowable costs, the new principles as proposed by the Joint Army-Navy-Air Force Audit Coordination Committee limit cost allowances.

Rear Admiral Frank Baldwin, S.C., U.S. Navy, who is chairman of the committee, in rebuttal to Mr. Packard's charges, indicated that Government agency heads, including those in the Treasury and the Bureau of Internal Revenue, feel that the Internal Revenue Code allowances of costs are unsuitable for individual contracts and were not designed for that purpose.

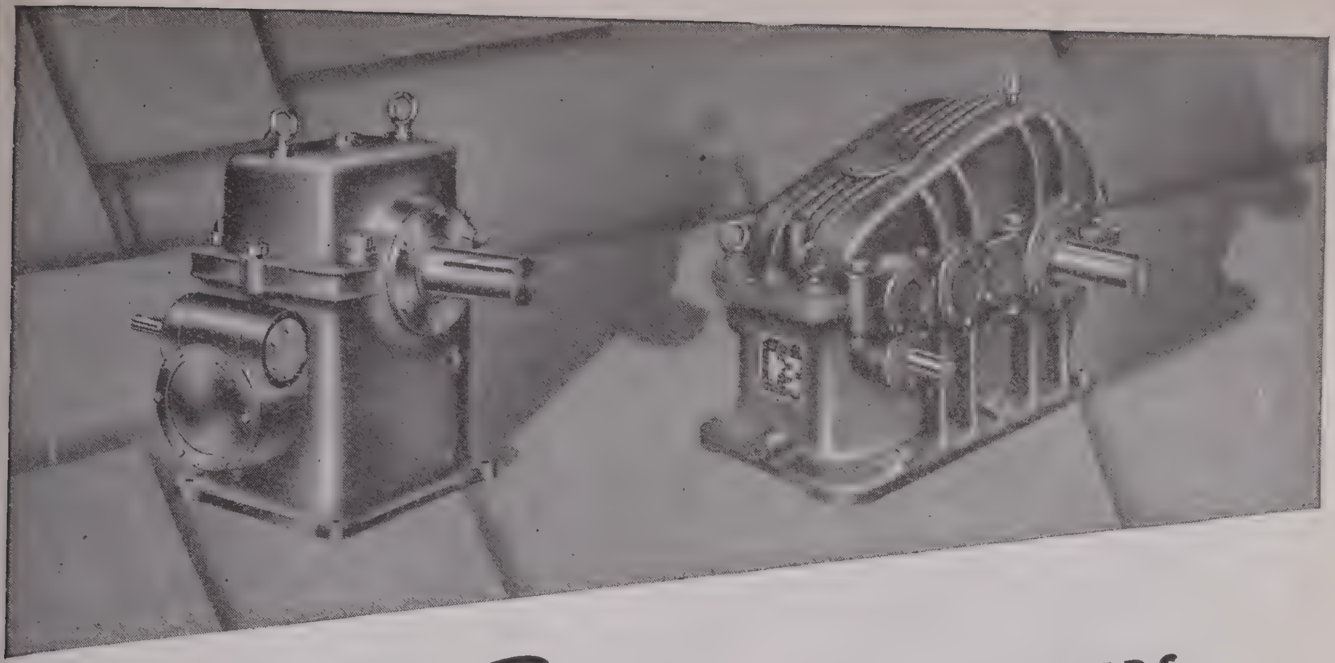
Steel Men Annoyed

(CONTINUED FROM PAGE 124)

the government and by the public is how much steel do you want to send where. Here we have a situation where one department of the government is vying with several other departments for a larger and larger proportion of the output of steel. You want steel for the freight car program. The State Department wants steel for Europe. You want steel for small business. . . . I thoroughly agree the problem is just as severe in Pittsburgh, Cleveland, Cincinnati, Dayton, as it is in the Pacific Northwest and the South . . . I think it is a national rather than a local situation."

Adam Hazlett, vice-president, Jones & Laughlin Steel Corp., summed up what steel members were thinking: "There is a shortage everywhere and the problem we are wrestling with has no happy solution. As you relieve a situaiton in one place you create another one in another place. And so it goes."

But because Mr. Doxsey's viewpoint is not shared by many public officials, steel men expect to have to keep dancing attendance on Washington for some time to come. Though they find it tough they'll be polite. For the meeting adjourned with his warning from Senator Murray: "We are not attacking the industry except on the basis that the industry has a problem here as Senator Wherry has told you, and if the industry fails to work it out and these conditions continue the government will have to take action on it to protect the independent concerns of the country." The direction Senator Murray would like to have that action take showed up in his minority report—government allocations and a 10-million ton boost in capacity. THE IRON AGE, May 13, p. 106.)



Packaged Power TO MEET YOUR NEEDS

When machines must be operated at speeds faster or slower than the prime mover, Foote Bros. offers a complete line of enclosed gear drives, either helical or worm, to meet any requirements.

Where linear or rotary motion is to be actuated or controlled as in aircraft landing flaps, brakes or elevator controls, actuators may be engineered to meet any practical space and weight limitations.

Where gear assemblies are required, such as helicopter rotor transmissions, turbo-jet engine accessory drives or any service requiring mounted gears, Foote Bros.' years of experience can be of assistance to you in their design, application and manufacture.

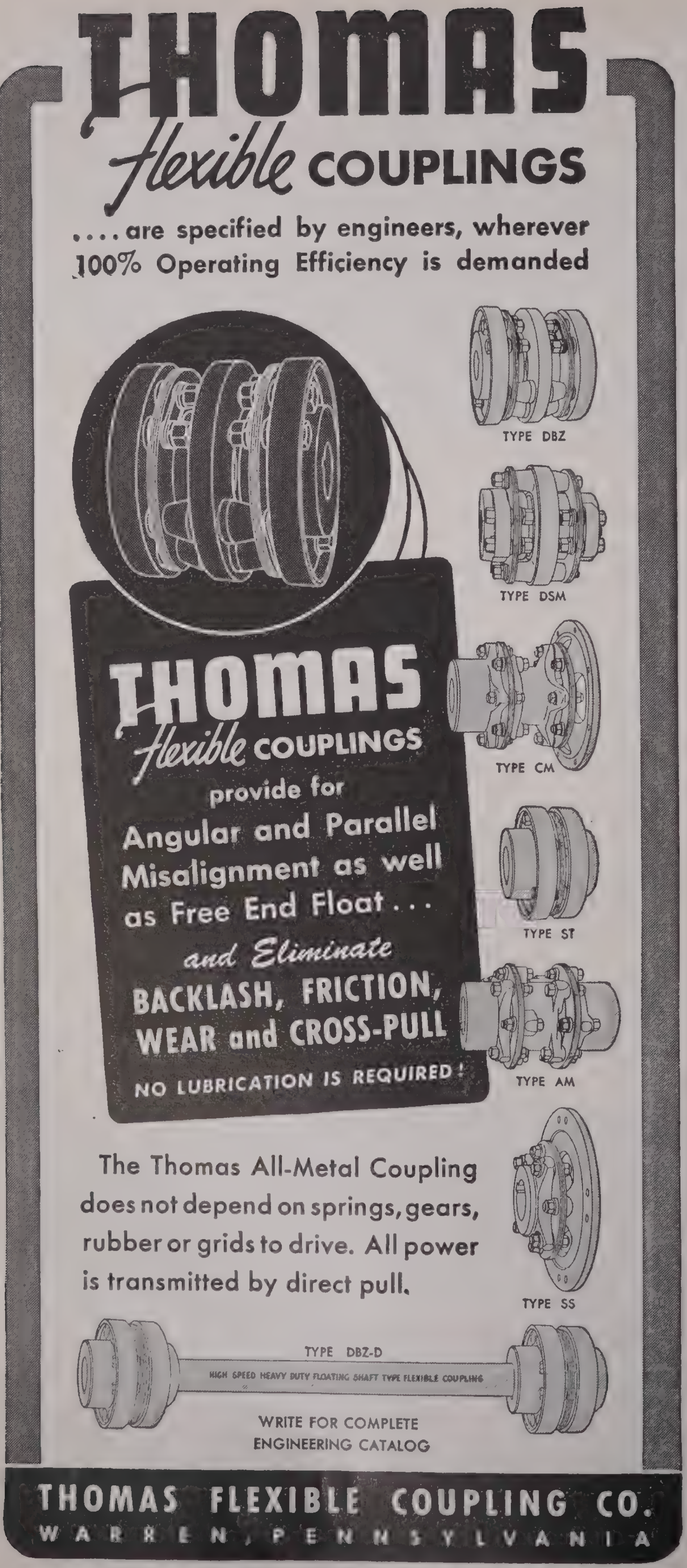
Performance of high quality gears depends in no small measure on the accuracy of their assembly and mounting in their housing. By providing complete units ready to install, Foote Bros. assures manufacturers the maximum efficiency, low noise level, compact size and minimum weight—characteristics of precision gears.

Foote Bros. engineers will gladly recommend the type of enclosed gear drive best suited to your needs and will work with you on the development of gear units to meet any special application.

FOOTE BROS. GEAR AND MACHINE CORPORATION,
Dept. M, 4545 S. Western Blvd., Chicago 9, Ill.

FOOTE BROS.

Better Power Transmission Through Better Gears



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.... are specified by engineers, wherever 100% Operating Efficiency is demanded

THOMAS *flexible* COUPLINGS provide for Angular and Parallel Misalignment as well as Free End Float . . . *and Eliminate* BACKLASH, FRICTION, WEAR and CROSS-PULL

NO LUBRICATION IS REQUIRED!

The Thomas All-Metal Coupling does not depend on springs, gears, rubber or grids to drive. All power is transmitted by direct pull.

WRITE FOR COMPLETE ENGINEERING CATALOG

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

Declares ERP Aid Will Lower Living Scale In the United States

New York

• • • **The help which** the United States is giving Western Europe under the Marshall Plan "must eventually be reflected in lowered living standards at home" George W. Wolf, president, U. S. Steel Export Co told midshipmen at the United States Naval Academy recently.

But said Mr. Wolf, "for this reason if for no other we are more than justified in helping the rest of the world speed the day when such help and consequent dissapation of our raw materials heritage will no longer be required."

Explaining that far too many people think we are far more self-supporting in respect to raw materials than is actually the case. Mr. Wolf said "The steel industry, in particular is not self sufficient from a national standpoint."

"Huge and ever-increasing amounts of raw materials vitally required for the manufacture of the millions of tons of steel of widely varying chemical and physical characteristics for even more widely varying end use requirements of our economy must be imported from aboard.

"Among such vitally important foreign raw materials to name but a few are: Tin, Manganese, Chromium, Tungsten, Palm Oil, Copper, Lead, Zinc, Nickel and Antimony.

"Tin comes largely from Malaya, the Dutch East Indies and other countries of the Far East, as well as from Bolivia . . . All of our requirements, totaling some 80,000 tons annually, must be imported.

"Manganese—About 14 lb of manganese are needed to make 1 ton of steel. At full capacity operations in the Steel Industry, approximately 1¼ million tons of 50 pct manganese ore must be imported. Prior to the war, Russia, India, South Africa and South America, in that order of importance, supplied 80-90 pct of our total requirements.

"Chromium comes from Russia, South Africa and the Philippines—almost all of our requirements must be imported.

"Tungsten comes largely from China and the Straits Settlements —60 per cent of our requirements must be imported.

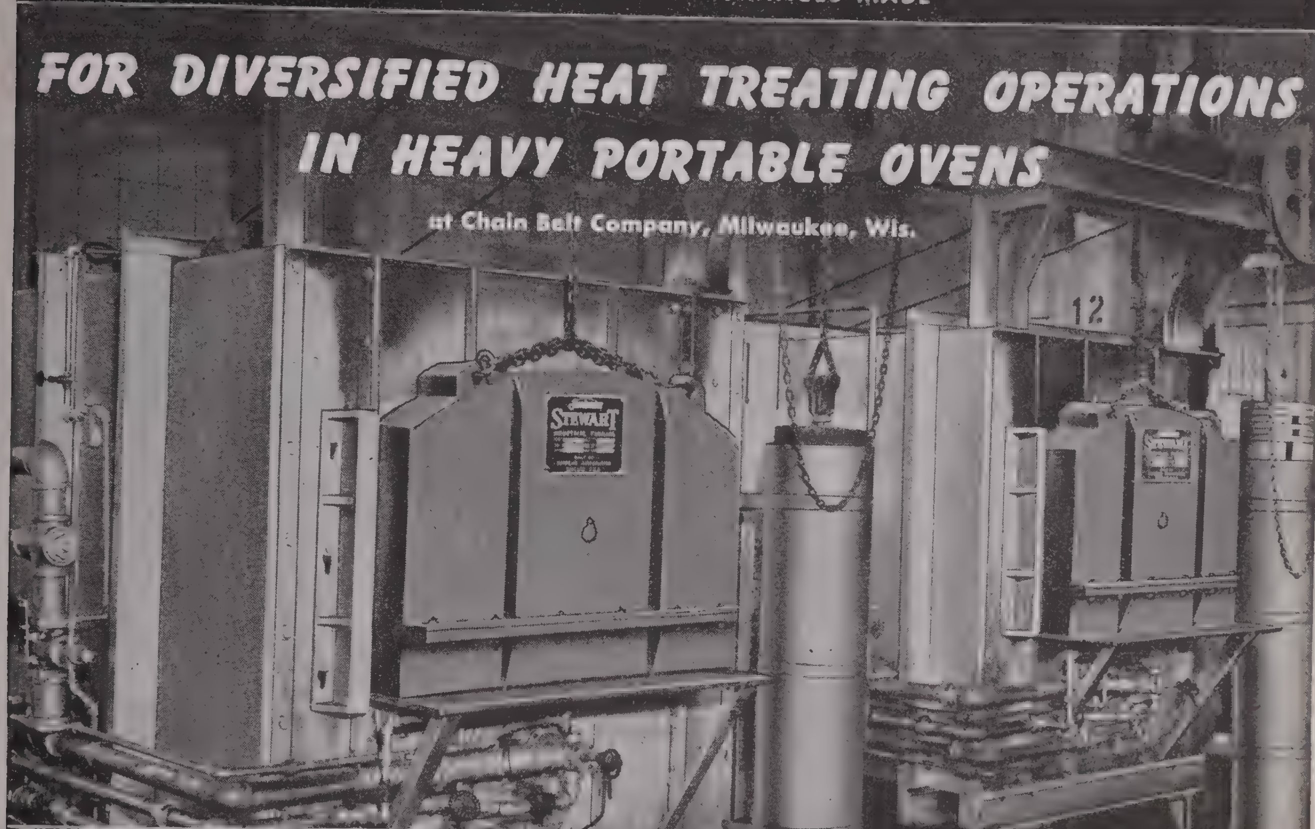
No. 82
of a
Series
of Typical
Installations

Sunbeam STEWART

THE BEST INDUSTRIAL FURNACES MADE

FOR DIVERSIFIED HEAT TREATING OPERATIONS IN HEAVY PORTABLE OVENS

at Chain Belt Company, Milwaukee, Wis.



Chain Belt is using these two Sunbeam Stewart Ovens within temperatures between 1150 F. to 1700 F. However, they can be used up to temperatures of 1800 F. This makes it possible to normalize, pack carburize, anneal, and harden.

Shown above are various sizes and types of roller and link chains manufactured by Chain Belt Company. They also make transmission equipment for drives and conveyors, construction machinery, and material handling equipment.

The ability to anneal, harden and normalize 2 oz. blanks or 500 lb. rough castings in 400 to 1500 lb. loads in two Sunbeam Stewart Heavy Portable Ovens has successfully solved Chain Belt's need for an installation for general all-around work on a 24-hour operation. In emergencies, these furnaces are also used for heat treatment of parts normally heat treated in continuous production units. The flexibility of these ovens, together with the close temperature control and even heat distribution throughout the heating chambers, makes them ideally suited for the many varied heat treating operations.

These units are equipped with combination oil/gas burners to permit use of either fuel. For ease of operation, doors are automatically raised or lowered by an electric motor hoist. The units are of heavy construction, designed for years of continuous service with a minimum of maintenance.

This installation demonstrates the versatility, quality and sound engineering of standard Sunbeam Stewart Furnaces. In addition, Sunbeam Stewart builds completely automatic units to meet specific production requirements.

SUNBEAM STEWART INDUSTRIAL FURNACE DIVISION of SUNBEAM CORPORATION
(Formerly CHICAGO FLEXIBLE SHAFT CO.)

Main Office: Dept. 110, 4433 Ogden Ave., Chicago 23—New York Office: 322 W. 48th St., N.Y. 19—Detroit Office: 3409 E. Grand Blvd., Detroit 2
Canada Factory: 321 Weston Rd., So., Toronto 9

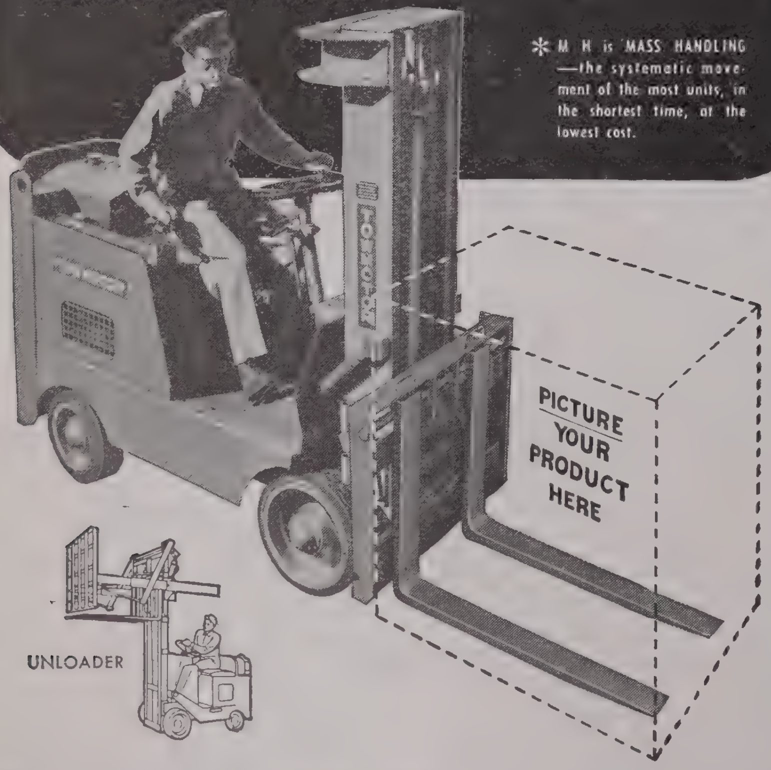
A letter, wire or 'phone call will promptly bring you information and details on SUNBEAM STEWART furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a SUNBEAM STEWART engineer will be glad to call and discuss your heat treating problem with you.

Is Your Product Priced to Sell?

Slash Production Costs with TOWMOTOR MH*

Cut 20% to 30% from present production costs with Towmotor Mass Handling. Rushing raw materials to production lines—speeding finished products to shipping—stacking full loads into overhead storage space—Towmotor is the busiest piece of equipment you'll ever own! Gasoline-powered Towmotor Fork Lift Trucks lift, transport and stack full loads any time, anywhere—operate at *maximum* capacity 24 hours a day, every day. Towmotor handling keeps pace with production. Take a tip from the men who make handling pay a profit: More professional handlers use Towmotor than any other fork lift truck. Send for FREE BOOK, Towmotor Materials Handling Analysis Guide.

*M H is MASS HANDLING—the systematic movement of the most units, in the shortest time, at the lowest cost.



Double and triple savings with standard Towmotor Accessories. However, if a standard Towmotor unit does not solve your handling problem, Towmotor engineers welcome the opportunity to design special equipment to meet your specific needs. Details are available without obligation.

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TOWMOTOR
THE ONE-MAN-GANG

FORK LIFT TRUCKS *and* TRACTORS

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"Thus, it may be seen that we are far from self-sufficient in regard to raw materials.

"That the civil and military authorities of our government are well aware of this is evidenced by the fact that special cognizance of this situation has been taken by the activation of the War Munitions Board and the National Security Resources Board under the newly formed Department of National Defense.

"Prior to this last war, and for many years, the British Empire and the British Fleet, furnished the sheltering wing under the industrial economy of the United States, in respect to foreign raw materials availability, operated. For it was the power of Britain that guaranteed to us not only the integrity of the source of needed foreign raw materials, but additionally the lines of communication between such sources and our shores.

"This task now devolves upon ourselves through the power of the United States Navy.

"If we should fail, it need hardly be pointed out that our industrial index would drop rapidly. And while I have only given you a partial list of the more important needed foreign raw materials, there are others, less important only in volume, the denial of which to our industrial economy would be indeed serious.

"Thus, in the formula of economic power equalling raw material availability plus human energy, plus tools, all multiplied by the efficiency of the use of such tools, there is a problem of continued satisfactory and adequate raw materials."

Oil Taken From Shale At Mines Bureau Plant Now Undergoing Tests

Washington

• • • **A railroad tank car** of more than 6,000 gallons of crude shale oil—the first bulk shipment of oil from the Bureau of Mines' new oil shale demonstration plant near Rifle, Colo.—is undergoing preliminary tests in the laboratories of a private oil company at Riverside, Ill., according to James Boyd, Director of the Bureau.

The shale oil will be "fractionated," or separated into the various grades of crude oil, by the Universal

TO PUT MACHINE TIME

ONLY

ON SOUND MATERIAL

The inspector at the Magnaflux MA-3 Unit at right views connecting rods automatically rotated before him under Black Light. Fluorescent *Magnaglo indications of forging defects are instantly and surely visible as shown above. The same Magnaflux Unit may be used for inspection of a wide range of steering and engine parts; other units for bar stock, etc.

Let MAGNAFLUX* find defects first!

Engineered inspection by Magnaflux eliminates defective parts *early* in production to avoid time lost machining material that must be scrapped when finished. This Magnaflux unit operates in the production line, automatically preparing parts for rapid viewing by the inspector.

Magnaflux makes it possible to concentrate machine time on inherently sound material. Inspection is fast, non-destructive, completely accurate . . . and applicable to a wide variety of parts. For full information write—

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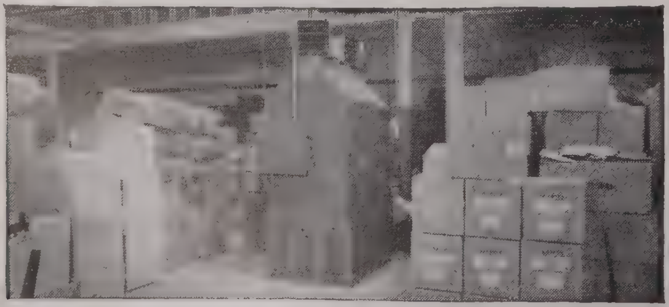
THIS IS
YOUR HEATING SUPERINTENDENT
WHEN YOU HEAT
WITH DRAVO HEATERS

It's an *automatic* fireman who goes on the job at the flip of a switch for the Sanatex Company of Chicago. It cuts operational and maintenance expense to the bone and solves what had appeared to be an expensive heating problem for this processor of wiping cloths.

Not only is an attendant unnecessary—boiler-room and ductwork expense was eliminated, too, by installation of a Dravo *Counterflo* Heater. Centered along the east wall, the Dravo *Counterflo* Heater is entirely self-contained—requiring only power and fuel lines and a small vent stack. Its 1,000,000 BTU output is directed slightly over the heads of the workers to blanket 10,000 square feet of unbroken plant area with draft-free warm air. Cold corners and excessive roof heat loss are eliminated. During summer months, a touch of the selector switch converts the Dravo *Counterflo* Heater immediately into a powerful air-circulating unit.

Dravo *Counterflo* Heaters are available in sizes ranging from 400,000 to 2,000,000 BTU output. Equally efficient with oil or gas and with or without ductwork, they can be floor-installed, wall-hung or roof-hung. Write for Bulletin HT -516. Heating Section, Dravo Corporation, Dravo Building, Pittsburgh 22, Pennsylvania.



According to Mr. Schulman, President of Sanatex Company, the Dravo *Counterflo* Heater "is the best equipment we ever had. Delivery of heat is virtually instantaneous when the unit goes into action—an important fuel-saving feature which eliminates the need for anticipating cold spells or keeping the heater in operation when the plant is closed."

Dravo also manufactures the *DRAVO CRANE CAB COOLER* for air conditioning hot-metal crane cabs

DRAVO CORPORATION

PITTSBURGH • CLEVELAND • PHILADELPHIA • DETROIT • NEW YORK • CHICAGO
ATLANTA • BOSTON • *Sales Representatives in Principal Cities*

Oil Products Co. at Riverside, after which the Union Oil Co. will conduct cracking and other refining studies in its California laboratories, Director Boyd said.

Although smaller lots of shale oil have been sent previously to research laboratories, the tank car of 6,369 gal. leaving Rifle on May 18 was the first shipment of its kind.

The Bureau's oil shale demonstration plant, a part of the long-range $60,000,000 synthetic fuels research and demonstration program, has been in operation several months.

Alco Starts Production of Electric Locomotives

Schenectady

• • • **End of current** steam locomotive production came to the American Locomotive Co. plant here recently for the first time in a century as an accelerated diesel-electric locomotive program entered a new phase.

As the last steam locomotive left the 112-acre plant under its own power for Cleveland, a huge 1500 hp freight diesel-electric for the Central Railway of Brazil was being completed in another part of the locomotive factory. This is the first postwar road locomotive built for export.

Alco's facilities here will be devoted 100 pct to the manufacture of diesel-electric locomotives. P. T. Egbert, vice-president in charge of the locomotive division, explained, "American Locomotive is not intentionally going out of the steam locomotive business. It is simply a matter of demand. All orders and inquiries for new motive power from domestic railroads are for diesel-electrics.

"We have been preparing for this day for a number of years and have invested more than $20 million to convert our facilities from steam production to diesel-electrics. It is estimated that our diesel-electric production this year will be 150 pct of that for 1947."

Mr. Egbert said that some of the vast steam facilities have already been converted to handle phases of diesel-electric manufacturing. Considerable steam locomotive space, however, will be "mothballed" to meet any future demand, domestic or foreign, for steam locomotives.

New "Manual Lincolnweld" Cuts Costs . . . . Makes Welding Easier

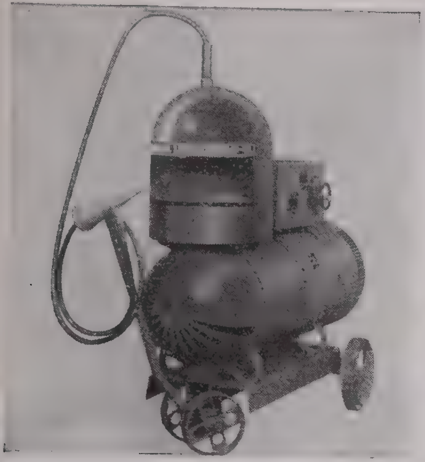


Fig. 1. "Manual Lincolnweld" and 600-amp. "Shield-Arc" welder. Can be used for automatic welding or hand welding with coated electrodes.

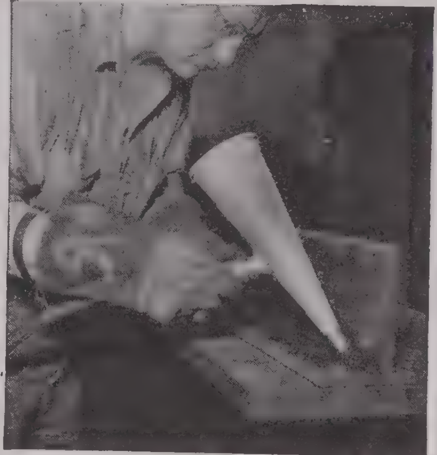


Fig. 2. Fillet welding ¾″ plate with a single pass weld. Welding gun contains sufficient granular flux for 12 feet or more of continuous welding.

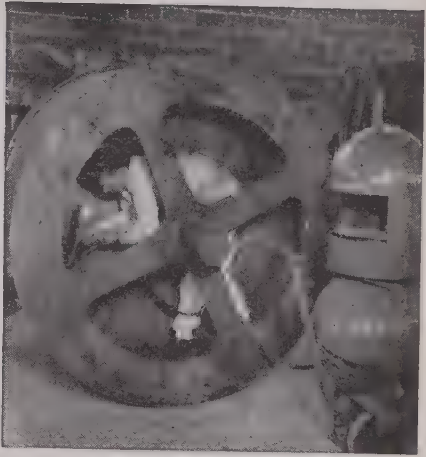


Fig. 3. Fillet welding ⅜″ plate ribs in this drum agitator at 450 amps. and 15 inches per minute with "Manual Lincolnweld."

By W. R. PERSONS, SALES MANAGER
THE LINCOLN ELECTRIC COMPANY
CLEVELAND 1, OHIO

FASTER welding speeds, deeper penetration and higher quality welds are now possible under greatly improved operating conditions with the new "Manual Lincolnweld." (Fig. 1). Hidden arc welding with granular flux, formerly possible only with completely automatic equipment, now becomes practical on all types of flat and near-flat work with the same ease and flexibility as hand welding with coated electrodes.

Welds produced with the hand welding gun, shown in Fig. 2, are made under a blanket of granular flux, thereby eliminating spatter and producing a smooth and uniform appearance. Welding is greatly simplified by automatic feeding of a continuous electrode through the granular flux. Proper arc length is maintained at all times by presetting the arc voltage control, which automatically compensates for any arc length variation in the movement of the welding gun. To weld, the operator has only to bring the gun to the joint and with a slight scratching motion, start the arc. After the weld is completed, the gun is taken away, breaking the arc instantly and stopping feed of the wire.

Faster welding speeds are made possible with "Manual Lincolnweld's" ability to use currents up to 600 amps. with a $\frac{5}{64}$″ diameter electrode . . . a current *density* 8 to 10 times higher than used in any arc welding process now in existence. The rate of electrode feed, predetermined by the arc voltage control of the "Manual Lincolnweld," varies the electrode feed rate from 50 to 360 inches per minute.

Deeper penetration with higher joint strength, resulting from the high intensity currents, permits welding square-edged joints without bevelling or special preparation. With "Manual Lincolnweld," a 100% butt weld can be made in ¾″ plate with a single-pass weld from each side.

Cleaning of spatter, chipping and grinding of slag are eliminated by the smooth, clean welds. On most welds, the slag simply peels away after cooling. *Where product appearance is important, "Manual Lincolnweld" is the ideal welder.*

Parts may be machined before welding in many cases. The uniform application of heat from a small concentrated arc *minimizes distortion*, eliminating more costly machining of completed assemblies.

Many types of production work can be done more profitably with "Manual Lincolnweld." The welding gun, connected to the extremely flexible welding cable, is easily mounted on simple, inexpensive fixtures. This low-cost setup with "Manual Lincolnweld" makes it desirable where fixture expense must be kept to a minimum.

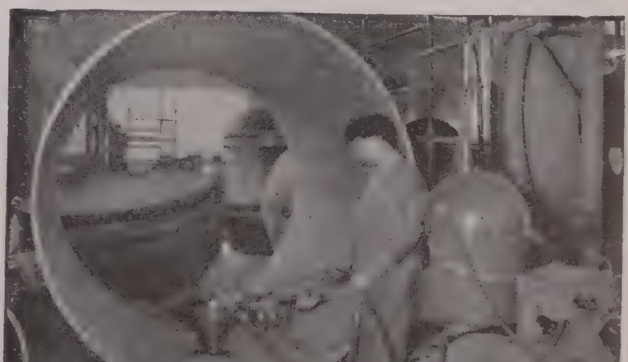
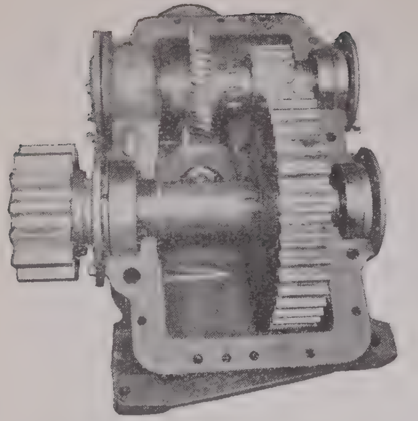


Fig. 4. Mounted on a simple, inexpensive fixture, "Manual Lincolnweld" may be used profitably for repetitive production work. Job shown is $\frac{15}{16}$″ plate butt welded with 550 amps. at 12 inches per minute.

The above is published by LINCOLN ELECTRIC in the interests of progress. For further information on "Manual Lincolnweld," write for Bul. 373. The Lincoln Electric Company, Dept. 67, Cleveland 1, Ohio.

Advertisement



STOP WORRYING ABOUT "ROOM FOR GEARS"

There is such a simple answer to it as many designers have discovered. More and more are specifying Cone-Drive speed reducers or gearing.

These gears save up to one-third the space required for other forms of gearing. (Obviously they also save weight.)

The reason? Cone-Drive gears are double enveloping with more teeth in contact, and more contact per tooth.

Just for comparison look at this gearbox —a typical drive for a 6-ton crane boom. Note how the Cone-Drive saves space.

Wherever standard Cone-Drive gearsets or speed reducers can be used, there are additional advantages in cost savings and delivery time. Cone-Drive gear sets and reducers are available in a wide range of standard sizes and ratios — from stock. They frequently simplify the job of designing better machine tools, materials handling equipment, mills, geared motors, etc.

We will be glad to supply you with technical data and installation information.

CONE-DRIVE
DIVISION
MICHIGAN TOOL COMPANY
7171 E. McNICHOLS RD., DETROIT 12, U. S. A.

PERSONALS

Continued from page 112

• **Fred O. Orthey** has been appointed works manager of the Dumore Co. of Racine, Wis. He joined the company in 1938 and since 1946 has been assistant works manager. **Charles M. Jacobs** has been appointed purchasing agent of the Dumore Co. Mr. Jacobs joined the company in 1933 and until recently served as assistant purchasing agent.

• **Ralph R. Brady** has been appointed manager of commercial engineering for the Westinghouse Electric Corp.'s Lamp Div., Bloomfield, N. J., succeeding the late **D. W. Atwater.** Mr. Brady joined Westinghouse in 1929, holding various executive positions in the commercial engineering department.

• **William J. Edmunds** has been named mill planning department supervisor of the Trentwood aluminum rolling mill, Permanente Metals Corp. **E. Wayne Everhart** is now in charge of the corrosion laboratory of Permanente Corp.'s research department at Spokane. Mr. Everhart had been recently employed by the Glenn L. Martin Co.

• **W. Howard Minton** has been appointed direct factory representative for the Macwhyte Co. covering the Gulf Coast area, with his headquarters in Houston.

• **E. L. Phillips** has been appointed assistant manager of sales of the Cold Metal Products Co., Youngstown. Mr. Phillips was formerly production manager. **A. C. Prudner,** formerly assistant production manager, has been appointed manager of the order department.

• **Henry E. Schaefer,** for many years manager of oil country sales division of Wheeling Steel Corp., Wheeling, W. Va., has retired after 46 years with the corporation.

• **Dr. R. Bowling Barnes** has been elected vice-president in charge of research and development of American Optical Co., with headquarters in Southbridge, Mass. For the past 12 years he has been director of the physics division of the Stamford research laboratories of American Cyanamid Co.

• **Arthur L. Chapman,** plant manager for Sylvania Electric Products Inc. plant, Warren, Pa., has been named to manage the company's Jamestown, N. Y. plant. Mr. Chapman has been with the company since 1933 and has been managing the Warren wire and weld plant for the past 5 years.

• **Ralph F. Koeneman** has been appointed assistant chief engineer of the passenger car engineering division of the American Car & Foundry Co., Berwick, Pa. Mr. Koeneman has been with the company since 1916 and has been in the passenger car engineering office with headquarters in New York since 1946.

• **Grant J. Casserly** has been appointed to head the machine service department of the Allison Co., Bridgeport, Conn. **Harold R. Powell** has been transferred from the research laboratory to the sales department. **Edward C. Scanlon,** formerly field engineer in northern New York, has been transferred to the New Jersey territory.

• **M. K. Schnurr** has been elected a director, vice-president and treasurer of Stainless Products, Inc., Elizabeth, N. J. Mr. Schnurr was formerly a vice-president of Bridgeport Brass Co. and secretary-treasurer of Rustless Iron & Steel Corp.

• **George L. Wanamaker** has been elected a vice-president of National Electric Products Corp., Pittsburgh. Mr. Wanamaker joined the corporation in 1907 and has been assistant to the president since 1926.

• **James W. Lafferty** has been appointed technical sales engineer of the Ira G. Perin Co., San Francisco. Mr. Lafferty will have his headquarters in Los Angeles.

• **Aubrey Ozias** has been named field engineer for Threadwell Tap & Die Co., Greenfield, Mass. Mr. Ozias was formerly connected with Ford Motor Co. and Continental Motors.

• **Paul Y. Duffee** has been appointed chief engineer of McConway & Torley Corp., Pittsburgh. For 16 years Mr. Duffee served as research development engineer for the Ohio Steel Foundry Co. and prior to joining McConway & Torley he operated the Duffee Engineering Service, Houston.

• **R. P. Wolchina** has been appointed factory manager of Conlon Bros. Mfg. Co., Chicago. Mr. Wolchina was formerly connected with the West Pullman plant of

What's your need in *SIZE?*

Globe seamless steel tubing is made hot finished and cold drawn in alloy and carbon steels in sizes from ½ inch to 6⅝ inches outside diameter.

Globe seamless stainless steel tubing is available in tube sizes from ½ inch to 6⅝ inches outside diameter and in pipe sizes ⅛ inch to 6 inches, standard, extra strong and double extra strong weights.

Gloweld (electric welded) stainless steel tubing may be had in sizes ranging from ¼ inch to 5 inches outside diameter inclusive, in standard weight pipe (schedule 40) sizes ⅛ inch to 2 inches, and in light weld pipe (schedule 10) size ⅛ inch to 4½ inch, inclusive.

Your tubing needs may lie somewhere within the above ranges — whatever your requirements, Globe is qualified by experience and facilities to supply you with tubing of the quality and uniformity you demand. GLOBE STEEL TUBES COMPANY, Milwaukee 4, Wisconsin.

GLOBE
Stainless
STEEL TUBES

Ingersoll Steel Disc Div., Borg Warner Corp.

• **J. J. Stephens** has been elected president, Strong, Carlisle & Hammond Co., Cleveland. Mr. Stephens, who is also treasurer of the firm, was formerly vice-president and general manager and has been associated with the company for 44 years.

• **Walter Koelliker** has joined Jack & Heintz Precision Industries, Inc. as engineer for the special aviation projects section. For the past year, Mr. Koelliker has been a partner in the engineering and sales firm of Walter Koelliker & Associates, Waterbury, Conn.

• **Charles R. Gebel** has been placed in charge of the new Chicago office of Permanente Products Co. He was formerly research engineer with Jones & Laughlin Steel Corp.

• **M. J. Herbs** has been appointed assistant export manager for the E. W. Bliss Co. with his headquarters in New York. Mr. Herbs has been associated with the Bliss Co. for the past 11 years. Prior to his present appointment he held positions of sales engineer and assistant to the production manager.

Obituaries

• **A. Fred Morris,** chairman of the board of the Morgan Engineering Co., Alliance, Ohio, died recently.

• **J. Driscoll DeWitt,** 49, employment manager of the Lackawanna, N. Y. plant of Bethlehem Steel Co., died May 31. He had been with the company 28 years.

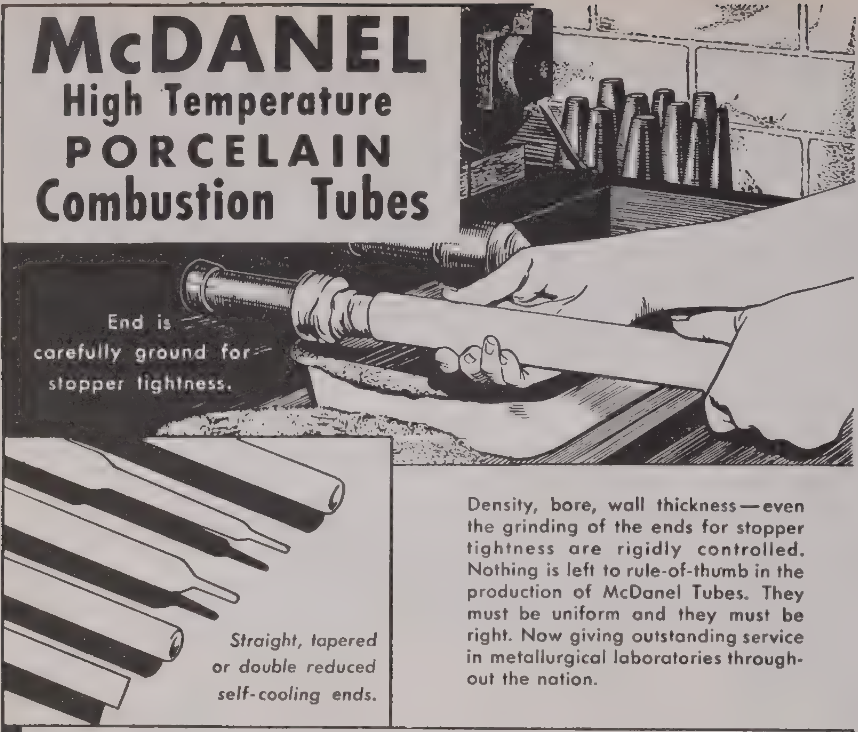
• **Carl T. Lund,** 57, president and general manager of the New England High-Carbon Wire Co., Millbury, Mass., died May 31.

• **William J. Muhlitner,** president of Great Lakes Foundry Sand Co., Detroit, died May 10.

• **Edward H. Luders,** 81, secretary-treasurer of the Kelker Blower Co., Buffalo, died May 21.

• **Henry Weber,** wire mill foreman at the Buffalo plant of the Wickwire Spencer Steel Div. of Colorado Fuel & Iron Corp., died recently.

• **Edward D. Duclos,** superintendent, Stacy Machine Co., Springfield, Mass., died May 21.


MCDANEL
High Temperature
PORCELAIN
Combustion Tubes

End is carefully ground for stopper tightness.

Straight, tapered or double reduced self-cooling ends.

Density, bore, wall thickness—even the grinding of the ends for stopper tightness are rigidly controlled. Nothing is left to rule-of-thumb in the production of McDanel Tubes. They must be uniform and they must be right. Now giving outstanding service in metallurgical laboratories throughout the nation.

OTHER McDANEL PRODUCTS
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Refractory Porcelain Specialties in stock or designed to meet specific needs.
Specify McDanel High Temperature Combustion Tubes from your supplier.

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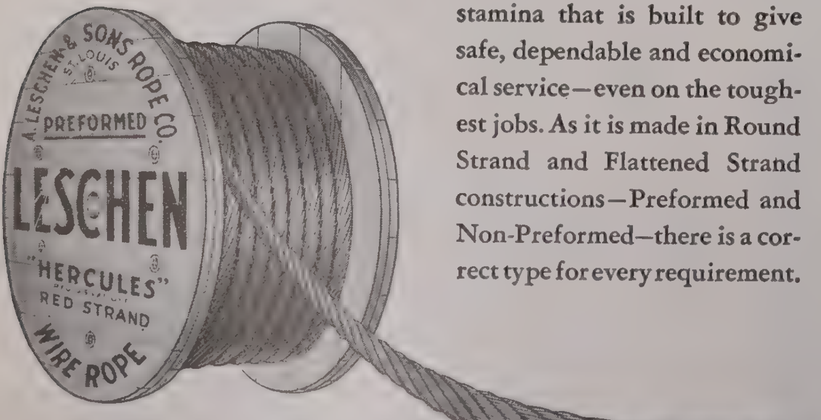
You Can Depend on

"HERCULES" (RED-STRAND) WIRE ROPE

Here is a Wire Rope with extra stamina that is built to give safe, dependable and economical service—even on the toughest jobs. As it is made in Round Strand and Flattened Strand constructions—Preformed and Non-Preformed—there is a correct type for every requirement.



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A. LESCHEN & SONS ROPE CO.
ESTABLISHED 1857
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NEW YORK 6 • CHICAGO 7 • HOUSTON 3 • DENVER 2
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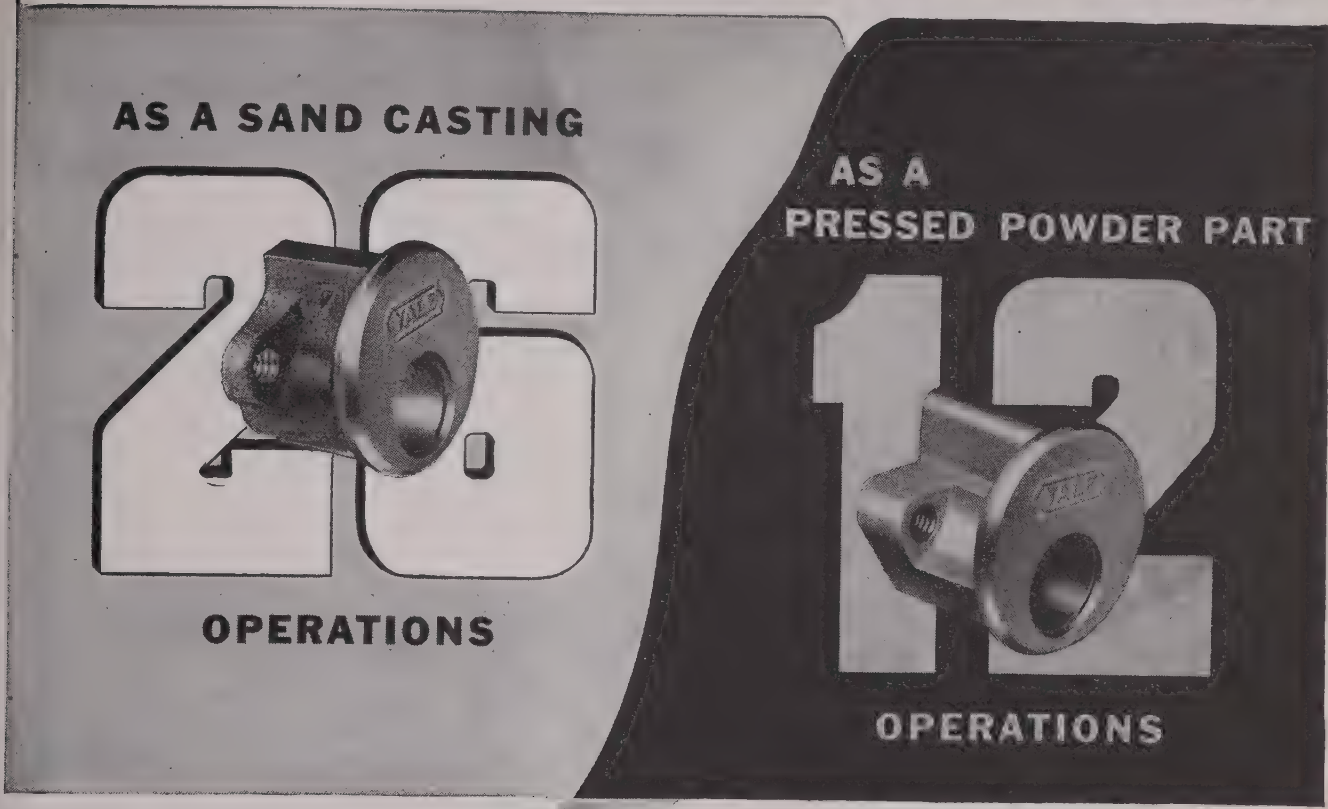
Case History on METAL POWDER Savings



14 MACHINING OPERATIONS SAVED

A REDUCTION FROM 26 to 12 OPERATIONS! That's what happened when The Yale & Town Manufacturing Co. changed from sand cast lock cylinders to pressed brass powder cylinders.

AND THESE ADDITIONAL ADVANTAGES WERE GAINED in the conversion to pressed powder fabrication:

1. Elimination of lost time and rejections from drill breakage—a constant problem with sand castings;

2. Reduction in scrap loss—because of fewer machining operations;

3. Easier machining where required—thanks to the free cutting qualities of pressed brass powder;

4. Sharper, cleaner detail and uniformity of appearance—resulting in a far better looking product.

Send us your blueprints

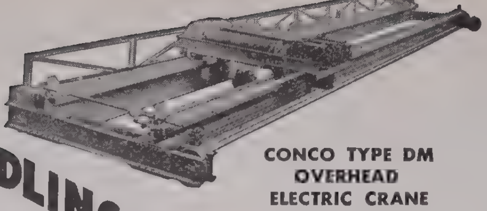
. . . If you are using a high production non-ferrous item, why not investigate the possibilities of making it in metal powder? Although The New Jersey Zinc Company does no fabricating of powdered metal parts we are producers of non-ferrous metal powders and shall be pleased to determine the suitability of your parts for this process . . .

HORSE HEAD PRODUCTS

THE NEW JERSEY ZINC COMPANY

160 Front Street, New York 7, N. Y. . . . . 221 N. LaSalle Street, Chicago 1, Ill.

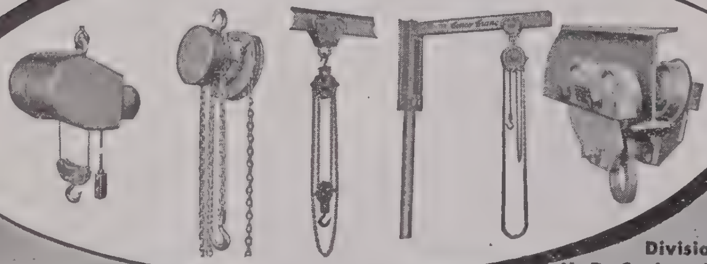
CONCO HANDLING EQUIPMENT



CONCO TYPE DM
OVERHEAD
ELECTRIC CRANE

● WRITE today for complete information on the CONCO line of hand-powered and electric cranes, hoists and trolleys — a complete line, tried and proven for over twenty years. CONCO engineers are qualified to recommend the right type of handling equipment for faster, more economical production in your shop. Write us now, and take advantage of our long experience in moving more materials, faster and at less cost.

CRANES • HOISTS • TROLLEYS



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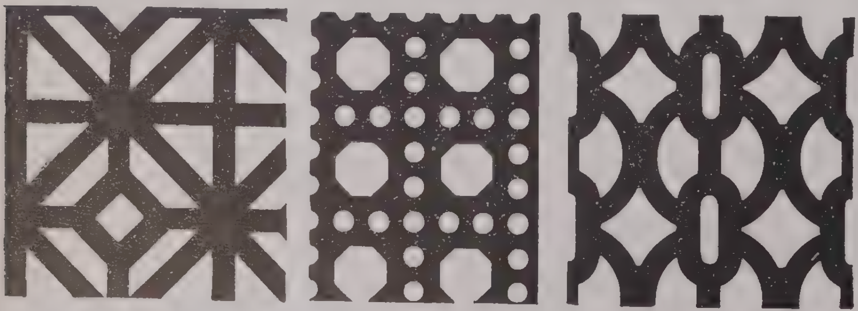
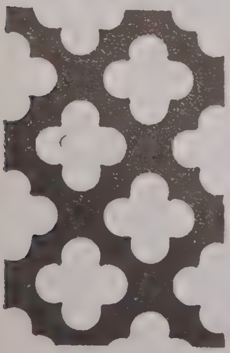
H. D. Conkey & Co.

CONCO ENGINEERING WORKS, 15 Grove St., MENDOTA, ILL.





Ornamental perforated metal

Hendrick offers a wide variety of decorative patterns in light weight, perforated metal, for radiator enclosures, stove panels, kitchen cabinets, and similar applications.

Regularly furnished in stock size sheets, such as 36 x 120 inches, in a special, bright finish, pickled steel suitable for painting or plating, in gauges from No. 16 to No. 24. These patterns can also be supplied in other metals, on special order. Write for full information.

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Perforated Metals
Perforated Metal Screens
Architectural Grilles
Mitco Open Steel Flooring,
"Shur-Site" Treads and
Armorgrids

Malleable Founders Elects New Officers

Hot Springs, Va.

• • • **Collins L. Carter,** president of Albion Malleable Iron Co., Albion, Mich., was elected president of the Malleable Founders Society for the coming year at its 51st annual meeting, succeeding Wilson H. Moriarty, vice-president, National Malleable & Steel Castings Co., Cleveland.

James H. Smith, general manager, Central Foundry Div., General Motors Corp., Saginaw, Mich., was elected vice-president. Four new directors taking office are John A. Wagner, president, Wagner Malleable Iron Co., Decatur, Ill.; John T. Llewellyn II, president, Chicago Malleable Castings Co., Chicago; Frank O. Parker, vice-president, Dayton Malleable Iron Co., Dayton, and H. Nelson Albright, manager, Columbia Malleable Castings Corp., Columbia, Pa.

The society honored Robert R. Fauntleroy, president of Moline Malleable Iron Co., St. Charles, Ill., with the Charles H. McCrea medal for the person "rendering the most outstanding service to the malleable iron industry." He is a three-time past president of the organization. The presentation address was made by Brinton Welser, vice-president of Chain Belt Co., Milwaukee.

Mr. Moriarty, in his retiring address, predicted that the shortage of steel scrap will become even more stringent unless we bring back to this country some of the ferrous material we have exported in previous years.

"For 50 years we have exported finished ferrous goods without receiving any scrap in return," Mr. Moriarty said. "In the war period alone we exported 120 million tons. If provision is made for returning this material in scrap form from abroad, it would eliminate the need for controls and allocations of pig iron."

Decartelization of Iron and Steel Works in British Zone at End

London

• • • **Reports from** Germany suggest that "Operation Severance" designed to decartelize the iron and steel works in the British zone is near completion. It is proposed to set up a North German Iron and Steel Industry Management to take care of matters regarded as beyond

UNION PACIFIC

The Governor of Colorado *invites You*

THE STATE OF COLORADO
EXECUTIVE CHAMBERS
DENVER

WILLIAM LEE KNOUS
GOVERNOR

To American Industry:

Look long at Colorado.

A vigorous, young state, awake to its opportunities yet aware of its needs, will challenge your attention and stimulate your imagination.

Natural resources we have in abundance with the water and power for their development. Our labor force is highly adaptable, our markets are rapidly expanding.

Our health-giving climate, our scenic setting make Colorado a soul-satisfying home for you and your families.

And most important — we know where we're going! Our leaders in business, industry, agriculture and education, through their Resources Development Council, are charting a course toward a sound, stable future for our people.

Look long at Colorado — it offers you much!

Lee Knous
Governor

Lee Knous

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Unite with Union Pacific in selecting sites and seeking new markets in California, Colorado, Idaho; Kansas, Montana, Nebraska, Nevada, Oregon, Utah, Washington, Wyoming.

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WAREHOUSE STOCKS OF

ALLOY BARS

ROUNDS
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Hot Rolled.
½" to 10" Rd.

Cold Drawn.
⅛" to 4½" Rd.
3/16" to 2" Sq.

⅜" to 2½" Hex.

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AMS—6260
6270
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FORGINGS

WRITE FOR OUR MONTHLY STOCK LIST

HY-ALLOY STEELS CO.

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CHICAGO 2, ILL.
RAN 5253

the scope of the individual undertakings established after the plan comes into operation. Each works is to be given as much freedom as possible.

There is opposition to the plan both from the industry and from the workers. The old combines, which have been opposing decartelization, urge that much bigger units should be established, the optimum figure of steel ingot production mentioned being 1 million tons. The trade unions emphasise that decartelization is only the first step, their ultimate aim being the complete nationization of the industry.

Output of steel in the bizone has shown a marked improvement recently. Production of steel ingots and castings was 362,649 metric tons in April compared with 348,736 tons in March and 304,480 tons in February.

Advisory Committee to Study Prefab Housing Steel Products Needs

Washington

• • • **The Question of Whether** or not the prefab house industry will get the voluntary set-aside of 58,000 tons of steel it asks for the second half of 1948 may be settled this week.

Members of the Steel Products Advisory Committee are to confer on June 22 with officials of the Office of Industry Cooperation in an attempt to give a final answer to the prefab manufacturers request. (THE IRON AGE, May 27, p. 123).

Secretary of Commerce Sawyer, meanwhile, has announced memberships in the General Steel Products Industry Advisory Committee and the Merchant Steel Products Advisory Committee. Both distributor groups are slated to play major roles in deciding how much ore—if any—of the nation's steel output will be rationed voluntarily.

Members of the General Steel Products Distributors Advisory Committee are Jerry I. Baron, Baron Steel Co., Toledo; J. F. Rogers, Beals, McCarthy & Rogers, Inc., Buffalo; Peter Cappio, Bushwick Iron & Steel Co., Inc., Brooklyn; F. C. Flosi, A. M. Castle & Co., Chicago; H. V. Douglas, Central Steel & Wire Co., Chicago; Wayne Rising, Du Commun Metals & Supply Co., Los Angeles; William H. Franklin, Edgcomb Steel Co., Philadelphia; William G. Carter, Faitoute Iron & Steel Co., Inc., Newark; Albert Levinson, General Pipe & Supply Co., Bell, Calif.; Mauray I. Cohen, Harry Harris Co., Kearny, N. J.; Harry Resnick, Universal Steel Co., Cleveland.

Also C. H. Bradley, W. J. Holliday & Co., Indianapolis; J. L. Fiscus, Huron Steel Co., Detroit; A. W. Herron, Jr., Jones & Laughlin Steel Corp., Pittsburgh; Richmond Lewis, Charles C. Lewis Co., Springfield, Mass.; Howard V. Clark, Reliance Steel Div., Detroit Steel Corp., Detroit; Everett D. Graff, Joseph T. Ryerson & Son, Inc., Chicago; H. A. Lowry, Seaboard Steel & Iron Corp., Baltimore; George W. Smith, Southern Steel Co., Birmingham; F. W. Krebs, Super Steels, Inc., Cleveland; L. B. Worthington, U. S. Steel Supply Co., Chicago; G. L. Stewart, Edgar T. Ward's Sons Co., Pittsburgh.

Members of the Merchant Steel Products Distributors Advisory Committee named are: Henry J. Allison, Allison - Erwin, Charlotte, N. C.; Wakefield Baker, Baker & Hamilton, San Francisco; Spencer E. Cram, W. Bingham Co., Cleveland; John H. Mize, Blish, Mize & Silliman Hardware Co., Atchison, Kan.; R. R. Witt, Builders Supply Co., San Antonio, Texas; P. M. McKenney, Conklin Tin Plate & Metal Co., Atlanta; Charles L. Hildreth, Emery - Waterhouse Co., Portland, Me.; William H. Bowe, Herrick Co., South Boston, Mass.; W. W. French, Moore-Handley Hardware Co., Birmingham; Roger K. Becker, Ohio Valley Hardware & Roofing Co., Evansville, Ind.; Edmund Orgill, Orgill Bros. & Co., Memphis; Ray P. Farrington, Potts-Farrington Co., Philadelphia; Edward F. Pritzlaff, John Pritzlaff Hardware Co., Milwaukee; Henry A. Hoeynck, Shapleigh Hardware Co., St. Louis; Alexander Thomson, Tanner & Co., Indianapolis; John P. Speck, Tiffin Art Metal Co., Tiffin, Ohio.

Increase in Dividends

Cleveland

• • • **Directors of** Arthur G. McKee & Co. declared June 4 a dividend of 75¢ per share on the Class B stock of the company, payable July 1 to stock of record June 21. Previously in 1948 two dividends of 50¢ each were paid on the Class B stock, which will make total payments to date this year of $1.75 per share. The next meeting of the directors for consideration of dividend payments will be held early in September.

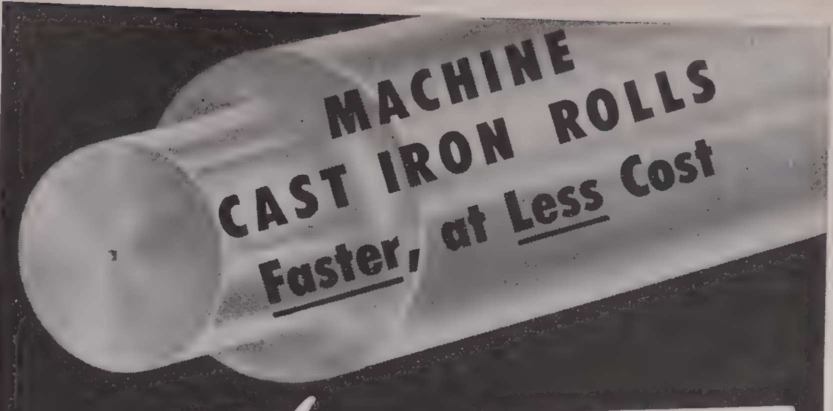
The company reported a considerable improvement has taken place this year over last year in the rate of progress on the large amount of work-in-process the company has on hand. New York taken to date in 1948, the company reports, approximates the same dollar volume taken during the corresponding period in 1947.

The company has completed an extension of about 9000 sq ft of floor space at its Cleveland office to provide additional space necessary for present personnel and for new personnel needed for increasing the number of the company's engineering and drafting personnel to meet greater demands for the company's services.

Elect New AMA Officers

New York

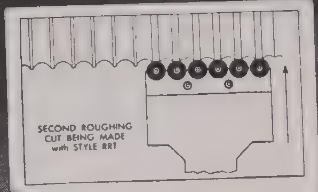
• • • **The American Management** Assn. has announced the following elections and appointments to offices and committee posts for the coming year: Chairman of the Board: John M. Hancock, Lehman Bros; Directors: Joseph B. Hall, president, Kroger Grocery Co., Cincinnati; Charles R. Hook, Jr., vice-president, personnel, Chesapeake and Ohio Railway Co., Cleveland; Ralph Kelly, president, Baldwin Locomotive Works, Philadelphia; L. R. Boulware, vice-president, General Electric Co., New York; A. L. Nickerson, director, Socony-Vacuum Oil Co., New York; Elmer Lindseth, president, Cleveland Electric Illuminating Co., Cleveland; R. P. Soule, vice-president, American Machine & Foundry Co., New York; Russell B. Gallagher, manager, insurance department, Philco Corp., Philadelphia; Claude V. McBroom, director of personnel and methods, Meredith Publishing Co., Des Moines, Iowa; George H. Williamson, president, Williamson Candy Co., Chicago; Chairman of the executive committee: Harold V. Coes, vice-president, Ford, Bacon and Davis, Inc., New York; Chairman of the finance committee: Don G. Mitchell, president, Sylvania Electric Products, Inc., New York; Honorary president: Alvin E. Dodd, for the past 12 years AMA president, was elected to the newly created post of honorary president; Presi-

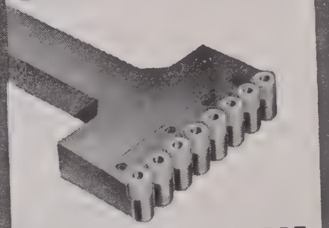


MACHINE CAST IRON ROLLS *Faster*, at *Less* Cost

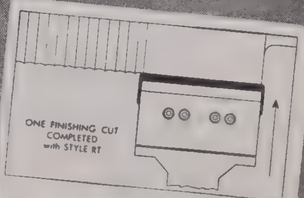
with

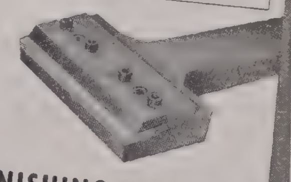
KENNAMETAL ROLL-TURNING TOOLS





ROUGHING STYLE RRT
Made in four standard widths— 4", 6", 8", and 10".





FINISHING STYLE RT
Made in four standard widths— 4", 6", 8", and 10".

FILLETING STYLE FT
Clamped-in, advanceable Kennametal blade. Made in six standard sizes — radii for the most common fillets.

It has been customary to rough grind very hard chilled cast iron rolls (75-90 Scleroscope), and to machine softer rolls (60-75 Scleroscope) with high speed steel tools.

The new, *and more economical*, method for both types is turning with Kennametal tools designed especially for plunge cutting on the usual hand-feed roll lathe.

They *cut the machining time in half*, as many roll shops have demonstrated to their profit.

These tools are rugged. The "business end" is Kennametal—a very hard cemented carbide, unusually strong and tough. It stands the gaff of crashing with a hefty cut through scale, chill balls, and burned spots (that wear grinding wheels fast and turn the edges of high speed steel tools)—*and does this in a hurry!*

Two general types of these tools are available:

Style RRT, recommended for roughing, has a series of indexable Kennametal cylinders, or "buttons", firmly secured to the steel shank. When cylinders become dull they are turned to present new, sharp edges

Style RT, recommended for finishing, has a flat, advanceable Kennametal blade, secured in position by a clamp and serrated back-up plate. Four cutting edges are usable in succession before any grinding is necessary.

Maintenance of these roll turning tools is very simple. To sharpen, cylinders of the roughing tool are faced on the tops only, and blades of the finishing tool on the long edges only. The marked savings in this technique can be readily visualized.

Here then are tools that help to offset the rising costs for time and labor in the manufacture and servicing of mill rolls. Our nearest representative will assist you in applying them to your problems.

KENNAMETAL
SUPERIOR CEMENTED CARBIDES
KENNAMETAL *Inc.*, LATROBE, PA.

Improve human efficiency with

REFRIGERATION BY Kelvinator

MADE BY ÉBCO MANUFACTURING CO. COLUMBUS, OHIO U.S.A.

properly cooled water

You make a two-way bid for better employee morale and higher efficiency when you provide plenty of *properly cooled* drinking water.

First, *cool* water is more inviting; it "urges" people to drink the water they need. (Few people drink enough water.)

Second, *cool* water makes people feel better. It's invigorating. It really *refreshes.* Refreshed people enjoy their work more, make fewer errors, get more done and do it better.

Best way to help your employees to this higher efficiency, smoother work and improved output is to install Kelvinator-refrigerated Electric Water Coolers. Your dealer has facts, figures *and experience* that will help you get highest returns from the fewest well-placed coolers. Write for details.

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Town and Lucas Sts., Columbus, Ohio

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DETROIT 2—720 Fisher Bldg.
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HOUSTON 2—Second National Bank Bldg.
Fairfax 0118—Teletype HO 372
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STEEL AND WIRE COMPANY, INC.
WORCESTER 1, MASS.

New York Philadelphia Cleveland Detroit Akron Chicago
Atlanta Houston Tulsa Los Angeles Toronto

dent: Lawrence A. Appley, former vice-chairman and executive director of the War Manpower Commission who will resign his present position as vice-president of industrial and public relations at Montgomery Ward and Co., to assume his duties on or about July 1st. Vice-Presidents-at-Large: Erwin H. Schell, Department of Business and Engineering Administration, Massachusetts Institute of Technology; Keith S. McHugh, vice-president, American Telephone and Telegraph Co.

Cited for Developments Made in Jet Propulsion

London

• • • **The Treasury** and the Ministry of Supply have accepted the recommendation of the Royal Commission on Awards to Inventors that a total award of £400,000 free of tax, should be made to Air Commodore Frank Whittle, for his work in the development of jet propulsion.

The official citation says the award is "in respect of his achievements in the science of aeronautics by devising and developing means of applying the principle of jet propulsion and for his improvements in the designs of gas turbines and air compressors for use in connection with jet propulsion."

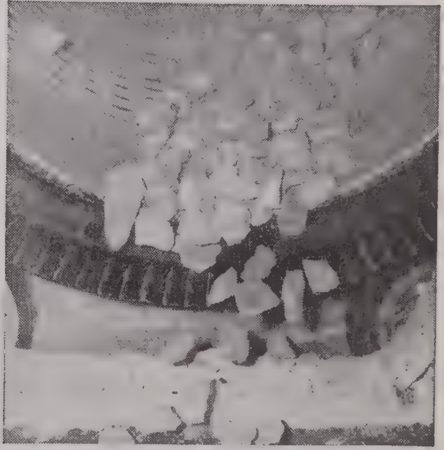
Air Commodore Whittle had refused to accept a cent for his inventions, on the ground that he was a serving officer. For the same reason, he refused an offer of £192,000 when his company, Power Jets, Ltd., was taken over by the government in 1944. The government thought, however, that he should have recognition for the inventions, which are now being used extensively, not only by the Royal Air Force, the government and industry, but also by foreign governments.

Licenses to Be Issued On Timetable Basis

Washington

• • • **Future licenses** against export quotas for a number of chemicals on the positive list will be issued on a definite timetable basis under a change in procedure by the Office of International Trade.

This is the same procedure recently adopted for steel mill products. It requires that all applications



THAT'S *ALL* THE WEAR *on these* AMSCO MANGANESE STEEL® SCREEN PLATES

. . . and it took the tumbling, abrasive battering of more than 7,000,000 tons of tough Illinois limestone to wear away this minor fraction of the original metal thickness. With a ¾″ thickness remaining, these Amsco Manganese Steel Plates are still on the job in the revolving screen which handles rough sizing and facilitates distribution throughout the plant of the 3½″ to 4½″ material from the secondary crusher.

This is only a small part of the Amsco manganese steel used at our customer's plant. In the production of limestone for railroad ballast and other purposes, Amsco manganese steel slows wear on crusher jaws, mantles, bowl liners, and other parts to a snail's pace.

Ductile to resist impacts; polishing and work-hardening to resist abrasion . . . "the toughest steel known" fights the battle against wear on every front. Take a big slice out of costs and delays caused by equipment repair and maintenance—specify AMSCO MANGANESE STEEL CASTINGS for abusive service.

AMERICAN
Brake Shoe
COMPANY

AMERICAN MANGANESE STEEL DIVISION
CHICAGO HEIGHTS, ILL.

Foundries at Chicago Heights, Ill., New Castle, Del., Denver, Colo., Oakland, Calif., Los Angeles, Calif., St. Louis, Mo.
Offices in principal cities. In Canada: Joliette Steel Limited, Joliette, Que.

MANGANESE STEEL CASTINGS
"CHROME-MOLY" STEEL CASTINGS
HARDFACING ELECTRODES
GRINDING MILL PARTS

DIPPERS DREDGE PUMPS CRUSHER PARTS CHAINS SOLIDS PUMPS BUCKETS WHEELS

IT'S THE LAW!

In Kentucky, no female may appear in a bathing suit unless armed with a club.

IT'S THE LAW COMPANY in Youngstown, Ohio, that installs hard-surface floors and all types of industrial flooring to meet your regular and special needs. Our hard-surface floors include SILICRETE, and FLINT-ROC (flint fines and aggregate). One of these special floors might make your plant more efficient:

MASTIC FLOORS—Heavy-duty rolling aisles.

HUBBELLITE—For improved sanitary conditions. Used in industrial shower rooms, dairies, food processing plants, etc.

STATIC CONDUCTING FLOORS—For use in the ordnance industry, and in hospital operating rooms.

HEAT-RESISTANT FLOORS—Pre-cast with high temperature cement and aggregate, with integral reinforcing mesh.

CORDED RUBBER—To soundproof rolling aisles, and for light assembly plants.

The Law Company specializes in floor work exclusively . . . hard-surface flooring and industrial floors of all types. Call or write today for a free estimate for your plant or building.

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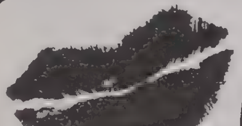

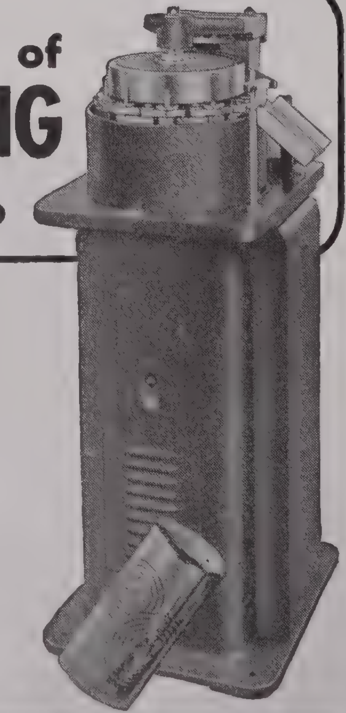

One kind of MARKING this machine won't do

But it does mark the case of the lipstick used by the young lady who left her mark. And more important to you is the fact that this addition to the Noblewest line can be tooled for marking a large variety of products in metal, plastic, hard rubber, wood, etc. Employs the famed Noblewest roll marking process. The inscription (including the delicate decorative design) is permanently rolled in—lasts as long as the product itself. You, too, can mark your products faster, better, cheaper with Noblewest Production Marking Equipment. Write Noble & Westbrook Manufacturing Co., 22 Westbrook Street, East Hartford 8, Conn.

MARK IT BEST WITH
NOBLEWEST IMPROVED MARKING DEVICES
NOBLEWEST

to export the listed items must be received by OIT before specific cutoff dates. While OIT would like all applications submitted within the 15 days preceding the cutoff date, the actual date received has no bearing on final validation or rejection.

Processing dates for major items for the third are as follows: July 15—chromium compounds; Aug. 1—caustic soda, white lead; Aug. 15—chromic acid, lead and chrome pigments; and Sept. 1—soda ash, antimony oxide and sulfide.

For the last quarter, the dates are: Oct. 15—chromium compounds; Nov. 1—caustic soda and white lead; Nov. 15—chromic acid, lead and chrome pigments; and Dec. 1—soda ash, antimony oxide and sulfide.

New Safety Devices Approved by Bureau Of Mines Now Ready

Washington

• • • A list of electrically-operated mine equipment tested during 1947 and approved as safe for use in gassy coal mines has been issued by the Bureau of Mines. Many new types of machines and devices now available for reducing explosion and other dangers incidental to coal mining are included in the report, prepared by A. B. Hooker, Bureau electrical engineer, Pittsburgh, Pa.

Loading and conveying equipment, drills, air compressors, coal cutting machines, locomotives, blasting units and switch boxes are among the equipment tested.

A copy of Information Circular 7465, "Permissible Mine Equipment Approved During the Calendar Year 1947," may be obtained free from the Bureau of Mines, Publications Section, 4800 Forbes Street, Pittsburgh 13, Pa.

An earlier publication is Information Circular 7432, "Permissible Mine Equipment Approved to Jan. 1, 1947, with Appended List of Available Flame-Lamp Fuels."

Engineers Society Elects New Officers

Chicago

• • • **Verne O. McClurg**, of Mundie, Jensen & McClurg, has been elected president of the Western Society of Engineers, succeeding William V. Kahler, vice-president of the Illinois Bell Telephone Co. Other officers elected were Gustav Egloff, research director of the Universal Oil Products Co., first vice-president; H. P. Sedwick, vice-president of the Public Service Co. of Northern Illinois, second vice-president; M. P. Vore, Jr., secretary and treasurer of Republic Flow Meters Co., treasurer.

Newly elected trustees were Wilfred Sykes, president of Inland Steel Co., and Fred T. Whiting, vice-president of Westinghouse Electric Corp. Ralph Budd, president of the Burlington Lines, has been elected an honorary member of the society for "outstanding contributions to the engineering profession."

Better Roof Support Methods to Lessen Coal Mine Hazards

Washington

• • • **Improved methods** of roof support designed to protect face workers in mechanized coal mines against the hazards of falling rock and coal are described in a recent publication of the Bureau of Mines. The report is the second in a new series dealing with roof control in underground coal mines.

Pointing out that 85 pct of all roof-fall accidents in coal mines occur at the working faces, the publication states that the need for effective systematic roof support in these areas "cannot be overemphasized." Because of the special safety problems created by mechanical cutting and loading equipment, roof supports used at the faces of mechanized operations should be devices to provide a maximum of protection and offer a minimum of interference with the preparation and loading of coal.

Directing attention to several advanced types of roof support currently employed at coal mines, the publication describes such techniques as the pin-jack method and skid-mounted supports, expansion-bolt methods, peg timbering, the hitch method and suspension supports. Detailed drawings and photographs illustrating the various roof-support methods discussed in the text are included in the publication.

A thorough analysis of mine roof conditions and the adoption of a systematic face timbering method devised to meet the specific condi-

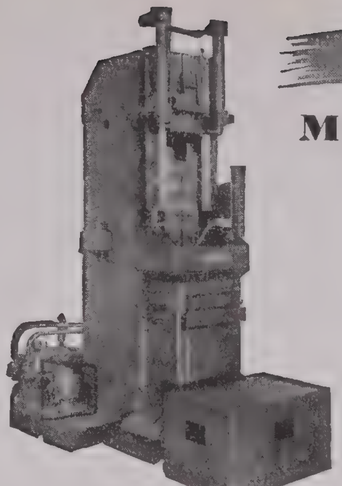

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Photo Courtesy Oil Gear Company

New type end-bell on totally enclosed motor has built-in conduit box with ample capacity to accommodate the multiple lead wires of dual voltage stators. Concealed through-bolts fastened from inside of upper end-bell give drip-proof construction and improved appearance. Oversized pre-lubricated ball bearings eliminate oilers or grease fittings.

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tions provide "the best insurance" against roof-fall accidents at the face, according to the report.

Authors of the publication are Edward Thomas, C. H. Seeling, and M. V. Hansen, Bureau mining engineers, and Frank Perz, a Bureau coal-mine inspector.

A free copy of Information Circular 7471, "Control of Roof and Prevention of Accidents from Falls of Rock and Coal" may be obtained by writing to the Publications Section of the Bureau of Mines, 4800 Forbes St., Pittsburgh 13.

Sets Up Appeals Board For Export Controls

Washington

• • • **The establishment** of an Appeals Board on export controls, and the appointment of Harrison Lillibridge of New York City as its chairman, has been announced by the Dept. of Commerce through its Office of International Trade.

The new Board has been created, in view of the growing importance of export controls, to provide a simple and efficient appeals procedure. Any exporter may appeal who feels that a regulation or administrative action of OIT works an exceptional or unreasonable hardship on him, or that it improperly discriminates against him.

The Board has been set up in the Office of the Assistant Secretary for Foreign and Domestic Commerce. Records will be kept of each appeal and will be available for examination by any authorized person.

The procedure, which will become effective June 15, requires that an appeal from a regulation must be filed in writing not later than 20 days after the regulation's date of publication. An appeal from the rejection or return without action of an export license application, or an appeal from the refusal of an extension of a license, must be made not later than 20 days after the date of the notification to the exporter of such action. The decisions of the Appeals Board will be final.

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Value of Wheat Double Compared With Steel

New York

• • • **A farmer could** exchange a bushel of wheat early this year in St. Louis for about twice as much galvanized sheet as he could get for it before the war, according to the American Iron & Steel Institute.

At the end of August 1939 a bushel of No. 2 Red winter wheat at St. Louis had a value equivalent to 14.7 lb of 28 gage galvanized, 1¼ in. corrugated sheet steel purchased in that city. In January 1947 a bushel of the same wheat was worth 29.5 lb of galvanized sheet steel.

In early 1948, a farmer buying galvanized sheet steel at St. Louis for use as roofing or siding in repairing his house or his barn paid 8.9¢ a lb for the product, as against 4.7¢ in late August 1939. In contrast to this, he was selling his No. 2 Red winter wheat in St. Louis at $2.56 a bushel, whereas he received only 69¢ a bushel in August 1939.

Output of Building Materials Up in March; Exports in Decline

Washington

• • • **With physical volume** of construction materials production in March increasing 15 pct over February, the production for the 1948 first quarter rose 3 pct over the first quarter last year, Bureau of Foreign and Domestic Commerce statistics show.

At the same time, the Bureau of the Census reports, exports of most of these materials for the same period were lower than a year ago.

Reflecting these factors, together with the normal seasonal rise, first quarter construction jumped 15 pct over building activities for the first quarter 1947. Private construction was up 18 pct over last year and public works were up 4 pct.

Construction. New construction put into place during April totaled $1.27 billion, a 27 pct increase over April 1947, bringing the total for the year to $4.6 billion. This is a billion more than for the same period in 1947.

Privately financed construction accounted for $3.7 billion or nearly 80 pct of the total; public works activity totaled $885 million, an increase of 22 pct against a 35 pct for privately financed building.

Industrial construction has lagged consistently behind 1947 activity, approximating less than a half-billion of the four-month totals and about 18 pct less than for last year.

On the other hand, construction of commercial types such as warehouses, offices, stores, etc., increased sharply over the first four months last year, rising to $346 million for the period this year as compared with $235 million. Public utility construction is up $685 million from $500 million.

A total of 257,000 new permanent housing units were started during the four-month period, compared with 205,000 for the same period last year.

Production. With a higher rate of output for most building materials, inventories were generally higher at the end of the first quarter. But in some lines no appreciable dent was made in backlogs of demand or unfilled orders.

In the case of cast iron pressure pipe, shipments continued to rise and if first quarter production is maintained, a new postwar peak will be reached in 1948. However, with unfilled orders still standing above a million tons, the backlog equals about 10 months shipments.

Likewise, bookings of fabricated structural steel continued to rise with March orders of 215,800 tons the largest reported since January 1946. In the meantime, the backlog of tonnage available for fabrication dropped below 600,000 tons.

Shipments of 78,800 tons of nails in March represents an increase of 10,000 tons over the first two months to bring first quarter totals to 216,800 tons. This is slightly less than for the 1947 first quarter and at this rate would fall short of 1948 estimated demands by more than 150,000 tons.

Exports. In general, first quarter export rates of major iron and steel construction materials declined somewhat. Reinforcing bars, fabricated structural steel, and nails are representative of items recording a drop when measured in terms of ratio of exports to production.

On the other hand, construction machinery and equipment were exported at approximately the same rate during the first quarter 1948 as in 1947. This may rise slightly during the last half as the effects of shipments under the Marshall Plan begin to be felt.

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Record Amount of Steel Received by Warehouses

New York

• • • **Steel warehouses,** which sell steel in small quantities at a time to thousands of small manufacturing plants, to oil companies and to buliders and contractors and others, received more steel last year than ever before in war or peace, the American Iron & Steel Institute announced today.

The increase in shipments of steel to warehouses reflects the fact that there are many more steel-using firms in business today, both large and small, then there were before the war.

The jobbers, dealers and distributors of steel received 10,484,000 tons of steel products in 1947, a tonnage approximately 57 pct larger than they received in 1940. That amount was 14 pct greater than in 1941 and 13 pct larger than in 1946.

Last year the steel jobbers, dealers and distributors received 17 pct of total steel shipments, compared with 15 pct in 1941 and 15 pct in 1940.

Oilmen Drill for New Deposits With Aid of Antifriction Bearings

New York

• • • **New high speed** antifriction bearings which are pushing oilmen's drills more than 3 miles into the earth's crust in search of new deposits may help to head off next winter's threatened fuel shortage, a joint committee of bearing engineers was told here.

In a report to the industry's ball and roller bearing engineers, H. O. Smith, secretary of the Antifriction Bearing Manufacturers Assn., said that rotary drill speeds in the new science of deep well drilling had been doubled through the use of precision bearings, making posible deeper penetrations than ever before.

In six states, oilmen are uncapping dried up wells and probing below 12,000 ft. to find new oil pools hitherto beyond the reach of their bits, it was pointed out. In the past year, 144 new and played out wells have been explored beyond the 12,000 ft depth resulting in the discovery of 10 new oil fields. The deepest penetration in the world, at Caddo, Okla., reaches to 17,823 ft or slightly more than 3 miles.

The oil industry, Mr. Smith said, now has an investment of more than $150 million in deep wells with each well averaging $363,000 and a total of 461 wells in the deep well class.

Constructs New Pipeline

Washington

• • • **Federal Power** Commission permission has been granted the Alabama-Tennessee Natural Gas Co. to construct 136 miles of additional pipeline and several auxiliary laterals. One project involves 75 miles of 10-¾-in. transmission line from near Selmer, Tenn., to Tuscumbia, Ala.; a second, 61 miles of 6-⅝-in. line from Tuscumbia to Huntsville, Ala. Costs has been estimated at $2.9 million.

Will Build 60 Steam Locomotives for India

Montreal

• • • **An order for** 60 steam locomotives to be produced at approximately $7,500,000 for the Indian Government Railways, has been placed with the Montreal Locomotive Works, Ltd., it was announced recently by Sir Frederick Carson, executive vice-president.

Delivery of these 4-6-2 Pacific type locomotives will begin in February 1949. It will be remembered that this company is already building ninety 2-8-2 Mikado type locomotives for India.

The new order for 60 locomotives to be produced by Montreal Locomotive Works, Limited is part of an order for 100 placed in Canada through the India Supply Mission.

Sir Frederick Carson stated that payment will be made in U. S. dollars which are so important to Canada at this time.

Older Workers Will Form Larger Portion Of Our Labor Force

New York

• • • **With a slowly** aging population, older workers "are likely to form a more and more important part of our labor force," according

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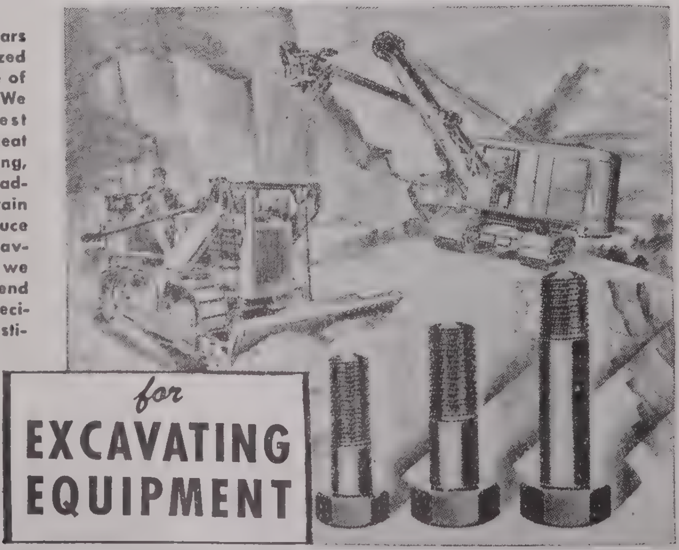

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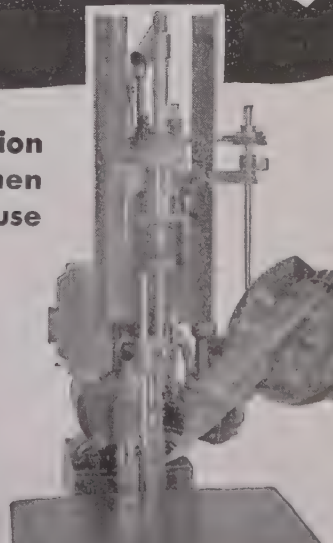

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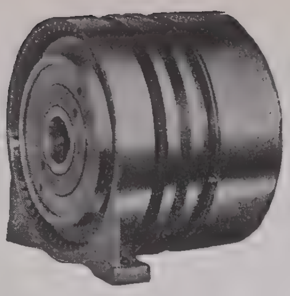

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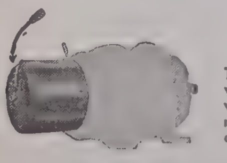

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to an analysis of future manpower resources completed by the National Industrial Conference Board.

The civilian labor force last year contained approximately 1.2 million workers over expectations based on prewar trends. Part or all of the excess, the analysis points out, may remain as permanent additions to the labor force, but "future movements, other than those that are seasonal in character, will, to a large degree, be the result of economic conditions and long-term growth."

Increasing in importance as potential sources of manpower are persons in the lower and upper age groups of the population, the analysis continues. "Long-term movements have evidenced a decreasing rate of labor force participation by youths and persons of 65 and over. Some of the causal factors accounting for these movements are longer schooling periods, child labor and social security legislation. Older workers, in particular, will constitute a large proportion of the working population as a result of a slow aging of the general population."

From March, 1940, to February, 1948, the median age of the labor force increased from 36.1 to 37.6 years. Women workers accounted for the most marked increase during this period, rising from 31.9 to 35.0 years. Aging of the male labor force took place at a slower rate, the median age increasing from 37.7 to 38.6 years. "Prior to the war there were sharp decreases in the proportion of aged workers, indicating an earlier rather than later retirement from the labor force." The proportion of persons 55 years old and over in the working population is expected to rise from 19 pct in 1940 to 31 pct in the year 2000. "In the event of increased demand, this group can provide one of the largest supplies of workers."

The presence of extra workers in the postwar labor force has caused a deviation from the expected ratio of males to females, the analysis notes. Based on the normal average for 1947, there are 1.1 million extra women workers in the civilian labor force as compared with an excess of 100,000 male workers. "The excess of females tends to heighten the trend of increased labor-force participation by women workers."

Still remaining out of the labor force at the end of 1947 were 1.4 million male veterans, of whom roughly 1.0 million were attending school, the analysis points out. "The reentrance of these veterans would tend to equalize the expected ratio of males to females. Workers in the middle age groups are participating below normal expectations. Among the males this can be traced to the large number of veterans now attending schools who would ordinarily have entered the labor force. The return of husbands and high marriage and birth rates following the end of the war of the war have reduced the number of female participants in the 20-34 year age group."

During the 1920's an average of 718,000 workers was added to the labor supply each year. This was an annual rate of increase of 1.6 pct. The following decade saw an annual average increase of 590,000 workers, or 1.2 pct per year. An acceleration of additions to the labor force is expected in the early and mid-1960's "as a result of the tremendous upsurge of births following the end of the war. A decline in the rate of increase of the labor force will follow if long-term movements are still in effect."

Youths accounted for 3.5 million, or 43 pct of the total of 8.1 million extra workers in April, 1945. Approximately 1.6 million were still in the labor force 2 years later. "This source will gradually decline in importance if trends in existence prior to 1940 continue indefinitely.

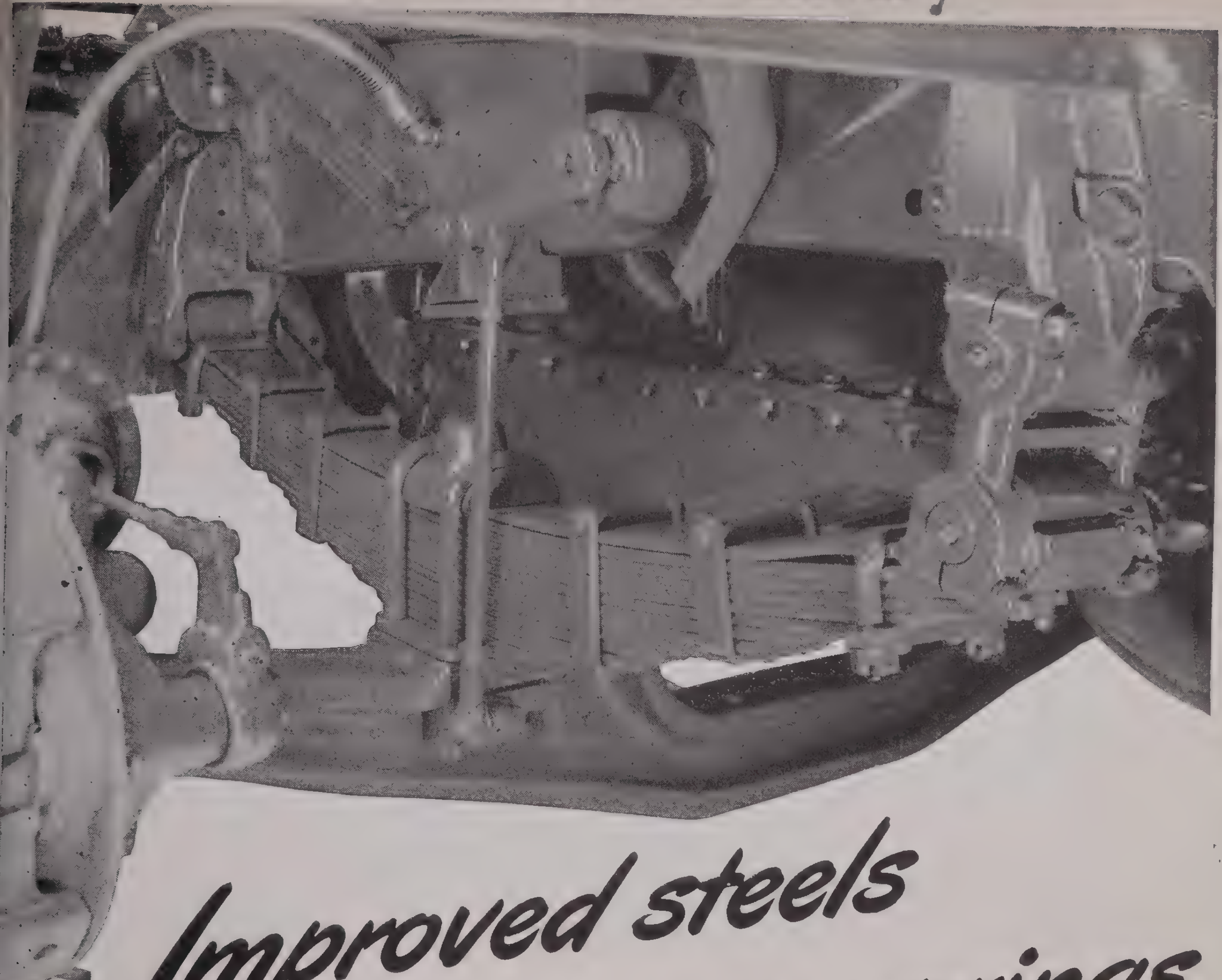
Offers 5-Day Course

New York

• • • **A 5-day training** conference in industrial experimentation will be offered by the Engineering School of Columbia University, New York, Sept. 14-18, 1948. The course is intended to provide both formal and practical insight into fundamentally effective technique for persons with a background of experience and at least one course in statistics, quality control, or the equivalent.

The fee for the conference, including all books and supplies and all lunches is $100. Inquiries and requests for brochure and application may be addressed to Professor S. B. Littauer, Dept. Industrial Engineering, Columbia University.

Illinois U Library



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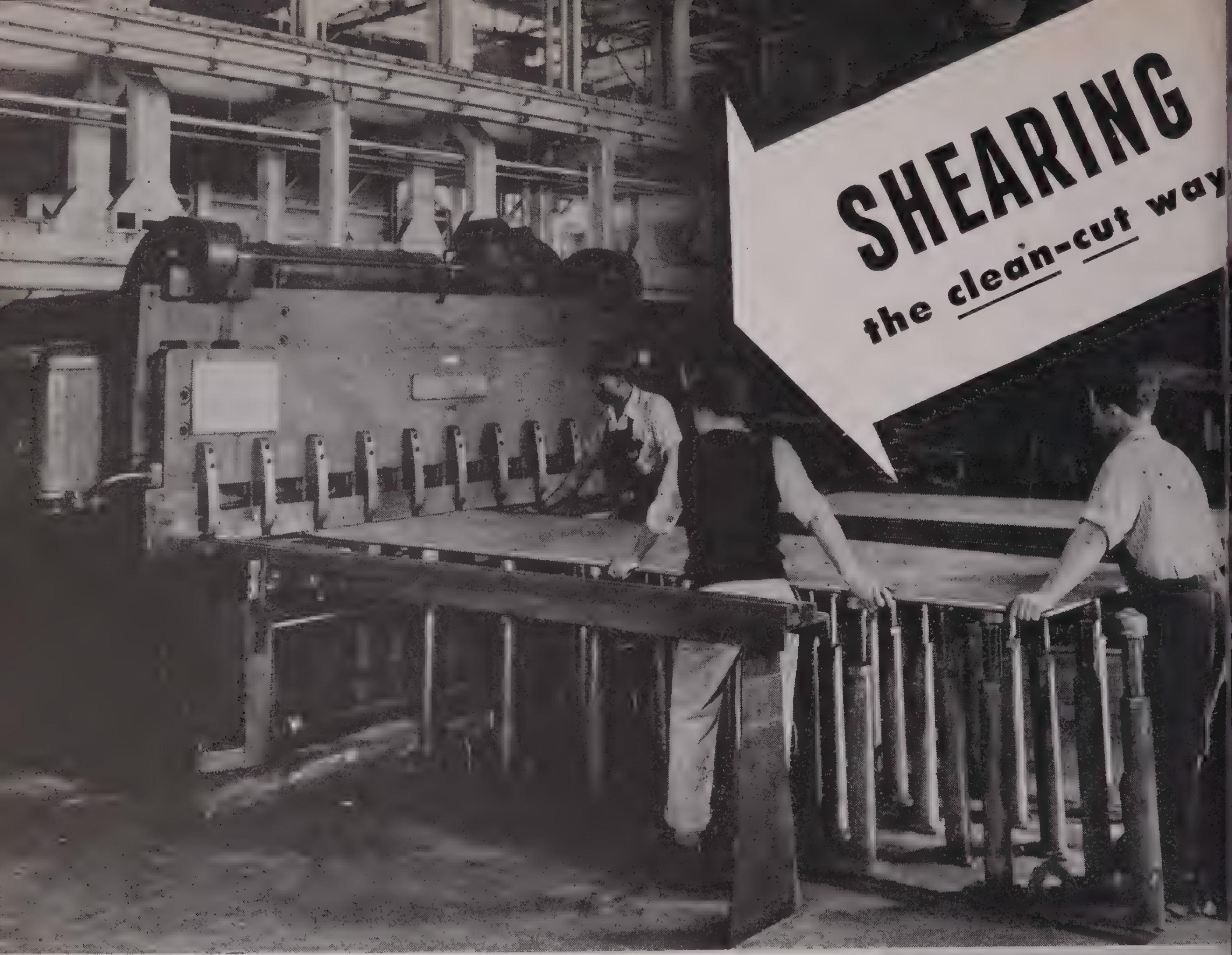

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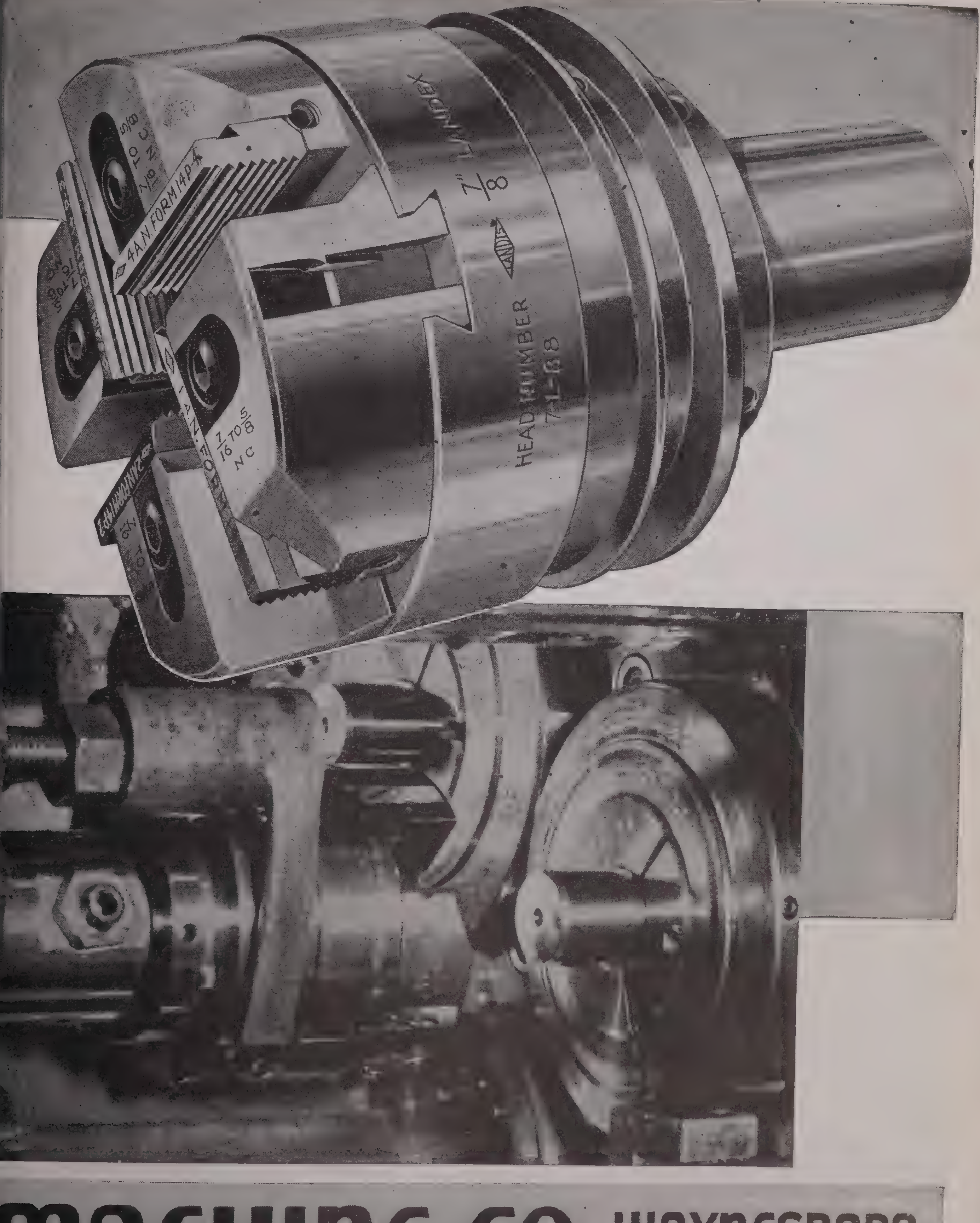

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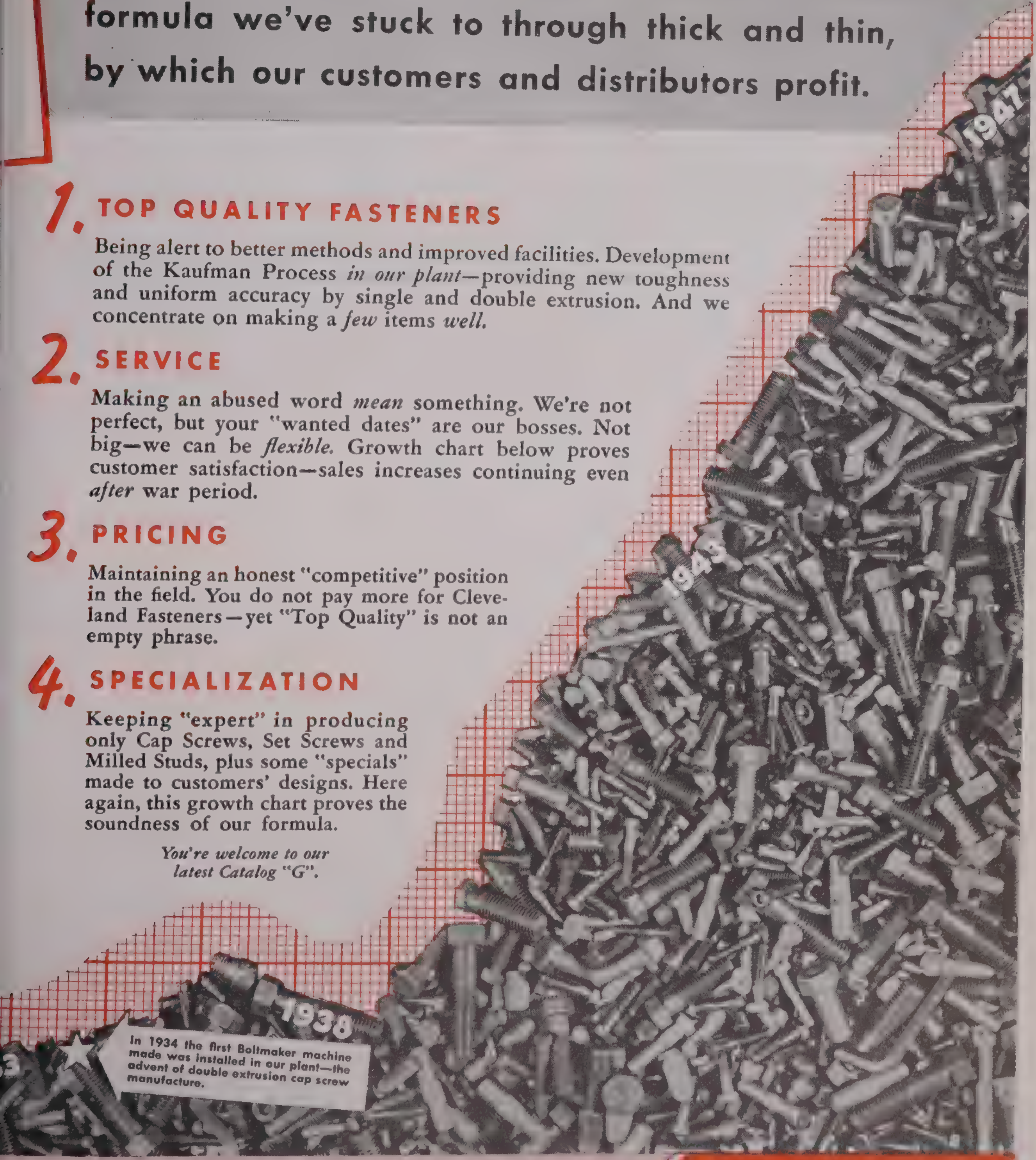

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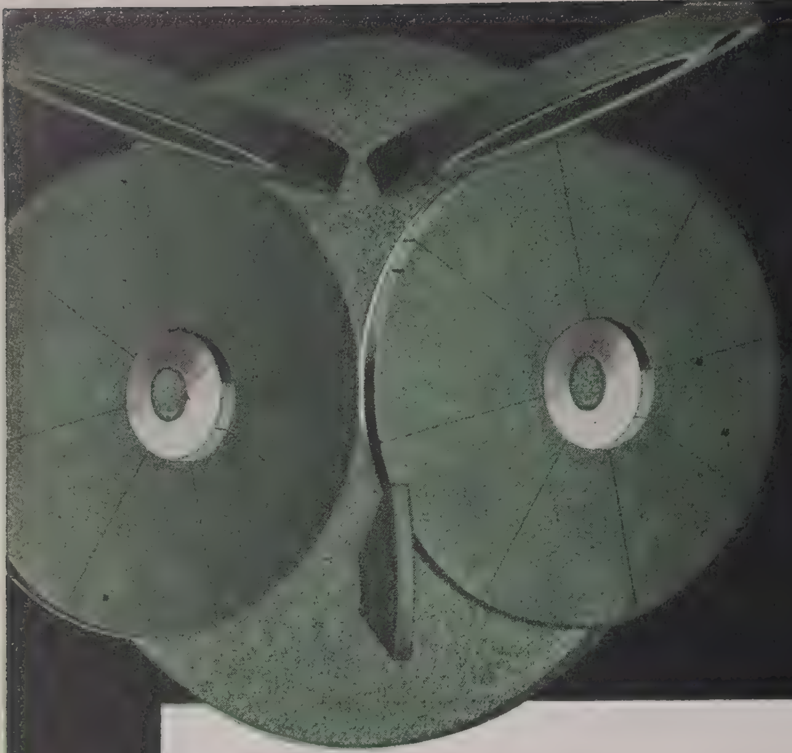


Want to hoot at grinding costs?

Might some of your profits be falling prey to excessive grinding expense? Are your wheel-wear and dressing costs higher than they should be, or your wheel life shorter?

You're afraid they might be?

Then call in a Peninsular engineer. That's the *wise* way to hoot at grinding costs!

Your Peninsular engineer will give your machines and methods, the materials you grind and the finishes you need a thorough analysis.

His recommendations and suggestions to you will be founded on *facts* and first-hand observation. And the wheels he prescribes for your grinding will be individually tailored to fit your needs.

Peninsular engineers have chased down hard-to-find profit leaks in the grinding departments of nearly every field of industry.

When may they put this experience to work for you?

The Peninsular Grinding Wheel Co., 729 Meldrum Ave., Detroit 7. *Sales Offices:* Chicago, Philadelphia, Buffalo, Cleveland, Pittsburgh, Houston, St. Louis, Cincinnati.

PENINSULAR

INDIVIDUALLY ENGINEERED

GRINDING WHEELS

SINCE 1889

SPECIALISTS IN RESINOID BONDED WHEELS

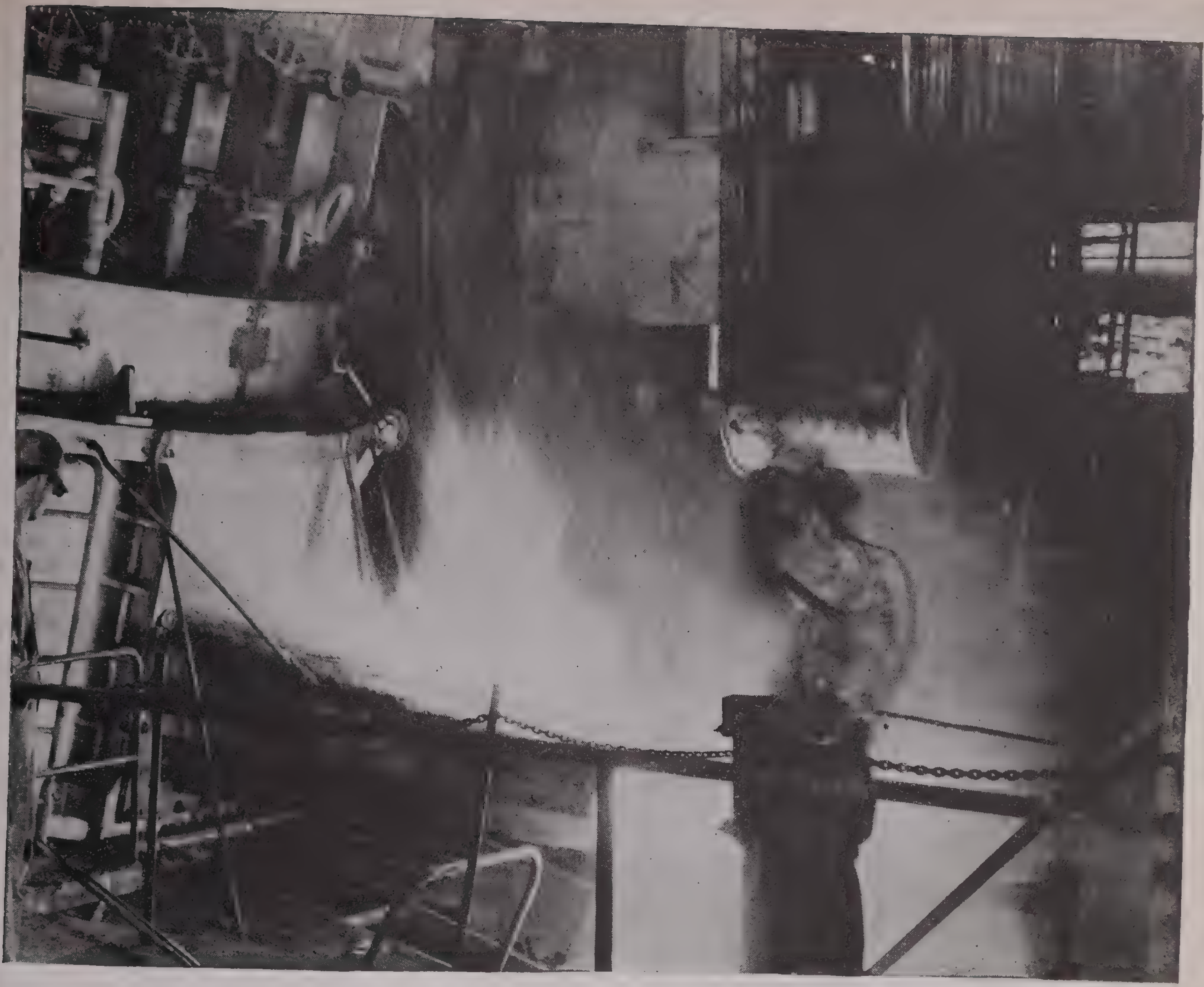
The component parts of the two illustrations on these pages consist of photographs of various standard types and sizes of grinding wheels manufactured by Peninsular.

How to increase Basic Electric Steel Output...

AT NO EXTRA COST

21 Large electric steel makers use **FERROCARBO-S** for faster heats—better slag manipulation

FERROCARBO-S is an efficient, economical ladle deoxidizing agent used in making higher quality open hearth and electric furnace steel.



From 15 to 45 minutes reduction in furnace time during the finishing period of heats properly worked at meltdown is directly attributed to FERROCARBO-S. That is the experience of 21 large basic electric furnace steel producers.

Diffusing rapidly throughout the slag, the constituents of FERROCARBO-S provide more rapid and efficient deoxidation. Slags remain carbidic throughout the heat—require very little attention. Furnace atmosphere also remains highly reducing. Practically all free carbon is in solution. Slags are manipulated easier. Good slag conditions are maintained at all times with minimum effort and supervision.

Getting such outstanding results, users enthusiastically endorse FERROCARBO-S as a slag conditioner. Their experience may be duplicated in your operation. Secure full data now by writing The Carborundum Company, Abrasive Grain and FERROCARBO Division, Niagara Falls, New York.

FERROCARBO-S

BY CARBORUNDUM

TRADE MARK

CARBORUNDUM

FERROCARBO Distributors: Kerchner, Marshall & Co., Pittsburgh, Cleveland and Birmingham; Miller and Company, Chicago, St. Louis and Cincinnati

"Carborundum" and "Ferrocarbo" are registered trademarks which indicate manufacture by The Carborundum Company

Alloy Steels

Assure Safety

. . . because they provide a most effective combination of strength, toughness, hardness and fatigue resistance

Regular inspections, such as the one being made here of the crankcase and air box of a Diesel locomotive engine, assure safety. So, too, does the use of alloy steels for crankshafts, connecting rods, pistons pins, axles, gears, bearings and other vital operating parts of Diesel engines. Ask Republic metallurgists what these steels can do for you.

★ ★ ★

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES, CLEVELAND 1, OHIO
Export Dept.: Chrysler Bldg., New York 17, N.Y.

STRENGTH—Through the use of alloy steels, highest strength values may be obtained without loading working parts with unnecessary weight or size. Furthermore, alloy steels maintain their strength throughout wide ranges of temperature.

TOUGHNESS—Alloy steels have the toughness needed to withstand severe strain, shock, vibration and sudden reversal of stress.

HARDNESS—When heat treated properly, alloy steels produce hard, wear-resisting surfaces—yet retain toughness at the core.

FATIGUE RESISTANCE—Alloy steels resist the insidious attack of fatigue which frequently causes failure in metals.

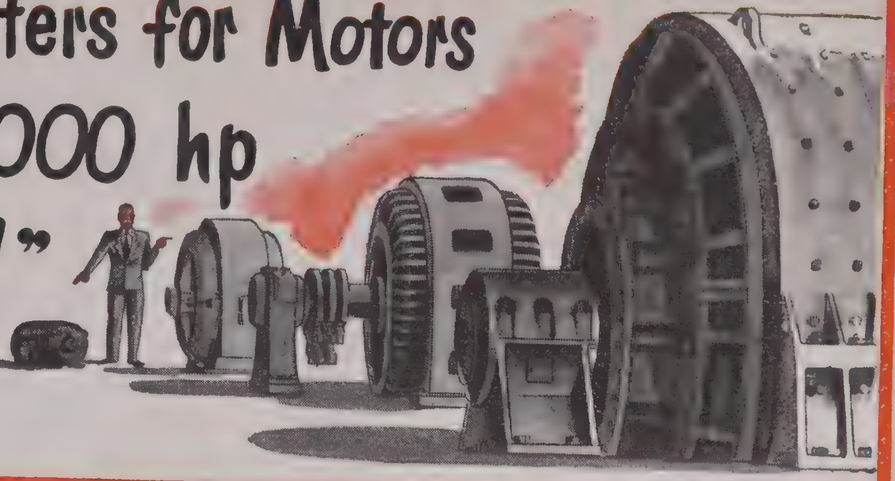
Republic—world leader in alloy steel making—is anxious to give you the benefit of its wide experience in applying alloy steels for greater safety—for increased efficiency and economy, too. Write us.

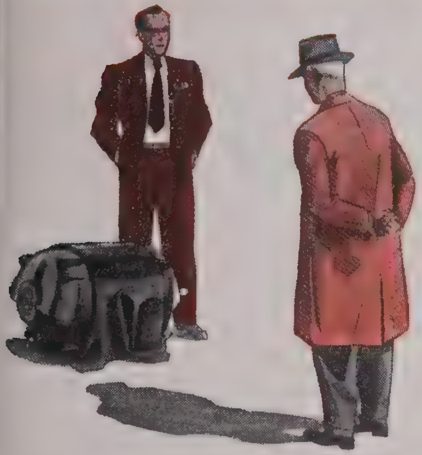
Republic
ALLOY STEELS

REPUBLIC STEEL

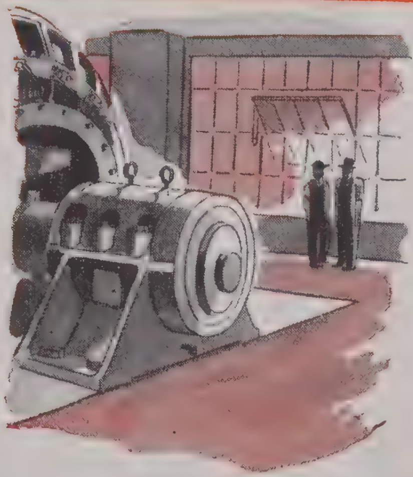
Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Plates, Pipe, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

"Headquarters for Motors ½ to 25,000 hp and Over!"





Do You Need General-Purpose, squirrel-cage motors from 1 to 200 hp? Call either your nearby Allis-Chalmers *Authorized Dealer* or District Office. They may be able to help you from stock right now!



But For Large Ratings—250 to 25,000 hp and over—your Allis-Chalmers *field engineer* is the man to call. He can give you *expert* motor advice; help you solve difficult drive problems involving large or small motors. And he'll save you time and money.

Allis-Chalmers Motor-Building capacity has been greatly increased. New methods, new equipment have been put to work to turn out *good* motors in greater numbers.

And Our Delivery Situation is improving! For *reliable* delivery information call any of over 60 District Offices or over 200 Allis-Chalmers Dealers. They have *up-to-the-minute* delivery information available to them!

Building Good Motors for Over 50 Years

THE *QUALITY* of Allis-Chalmers motors is best proven by their records of performance. Look back at your own experience, or ask your friends in industry who have "A-C" motors what they think of them. The answer is invariably the same . . . "They're *good* motors, liberally designed, easy to service, and run year-after-year with little attention."

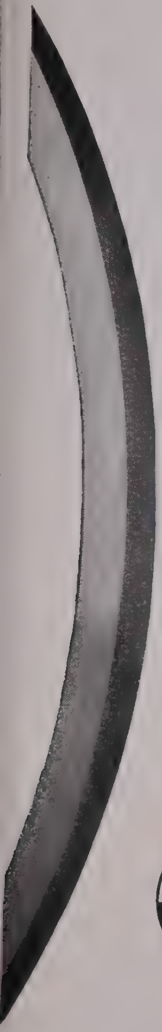
Whether you're buying ½ hp motors to be designed into your product . . . or a 25,000 hp motor for a steel mill you can rely on the *good* quality of "A-C" motors! ALLIS-CHALMERS, MILWAUKEE.

A 2400

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment—Biggest of All in Range of Industrial Products

There's no end to the weldless rings that STANDARD makes—



Rings are vital parts of hundreds of different industrial machines and devices . . . and when special properties and special quality are needed, you'll find that Standard Steel Works has important advantages in craftsmanship, experience, and facilities. The rings illustrated here are typical of the varied production that serves the needs of industry.

NOTICE
DESIGN AND PURCHASING DEPARTMENTS

Standard Steel Works is equipped to roll rings and other miscellaneous products of circular form, in practically all sizes up to 12 feet outside diameter. The mill equipment includes three units, each served by two steam hammers for preliminary operations. A blueprint or a dimensional sketch of the rings you require will bring you a prompt quotation.

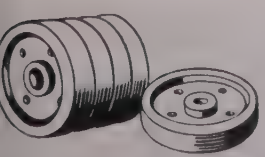
The Baldwin Locomotive Works, Standard Steel Works Division, Burnham, Pa., U. S. A. Offices: Birmingham, Boston, Chicago, Cleveland, Houston, New York, Philadelphia, Pittsburgh, San Francisco, Seattle, St. Louis, Washington.

BLW
THE BALDWIN GROUP

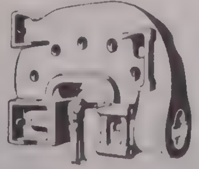
BALDWIN

STANDARD STEEL WORKS DIVISION

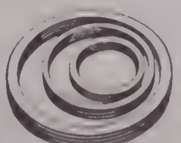
STANDARDIZE ON STANDARD FOR



WHEEL MILL PRODUCTS



STEEL CASTINGS



WELDLESS RINGS

FORGINGS

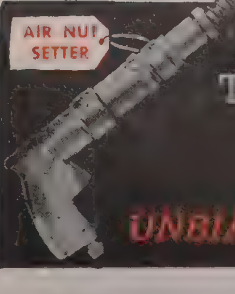
BEATS SPIRALS 2 TO 1

THIS manufacturer of steel kitchen cabinets was using hand spiral screw drivers to fasten hinges on doors because they never found a power screw driver light enough to hold in one hand while other hand holds the door. Screws are self-tapping type, size 8-32. The Rotor Application Engineer had the answer: Use the 26-ounce Rotor Air Screw Driver. They did, with these results:

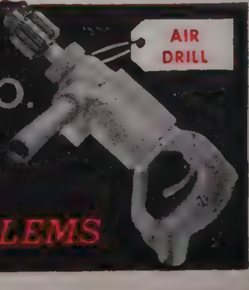
Output doubled. Twice as many hinges are screwed on per day with this "fly-weight" 1000 R.P.M. Air Powered Screw Driver. Cuts costs 50%.

We'd be glad to tackle similar problems in your plant.

AIR O'TOOL



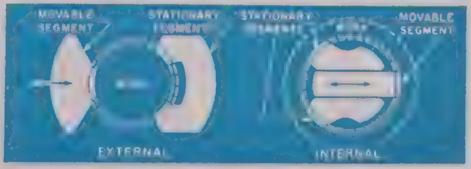
THE ROTOR TOOL CO.
CLEVELAND, OHIO
UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS



What's in VERMONT *this month?*

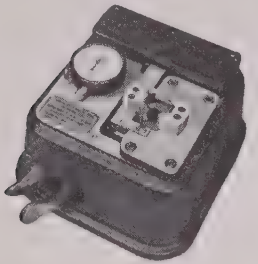
AN ENTIRELY NEW PRINCIPLE SPEEDS THREAD INSPECTION. A new principle of thread inspection has been developed that is *visual*, and so fast as to obsolete most conventional production gaging methods. It is more accurate and, even with inexperienced help, is 8 to 10 times faster than the ring and plug gage system. It eliminates threading and unthreading the part with the gage threads. It shows instantly the size, presence of burrs and out-of-roundness, and the accumulated inaccuracies of pitch, lead, diameter and thread form. It shows variation between production threads and a known master.

This new principle, developed by Bryant Chucking Grinder Co., Springfield, Vermont, employs three ground thread segments — two stationary and one movable by a control lever. To inspect external threads, just squeeze the control lever, drop the part between the three segments, release the lever and give the part a third of a turn — the large dial indicator gives an instant, visual, all-over check of thread accuracy. By again squeezing the lever, the part is lifted out without unthreading. Procedure for internal threads is identical except that part is dropped over the thread segments. Because threading is eliminated, the segments retain their ground-in accuracy over an extremely long life. Further, this feature eliminates taper wear as commonly found on the first few threads of worn ring and plug gages. . . . It won't cost to inquire.

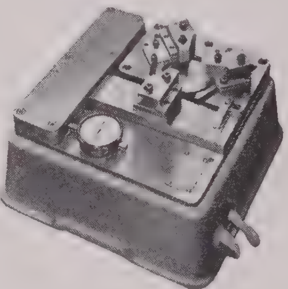


Bryant Chucking Grinder Co., Springfield, Vermont, U.S.A.

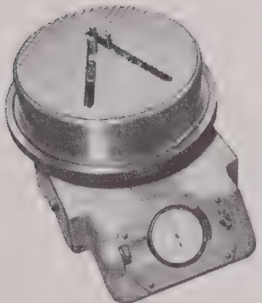
BRYANT *Thread Gages*



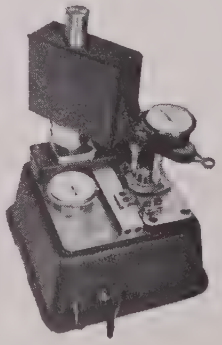
No. 1 External Thread Gage



No. 2 External Adjustable Thread Gage

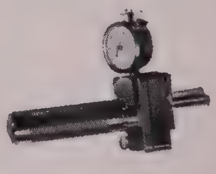


Universal Diameter Gage for Internal or External Plain Diameters



No. 1 Thread Gage with Squareness-of-Face Gage Attached

3-Flute Tap Gage

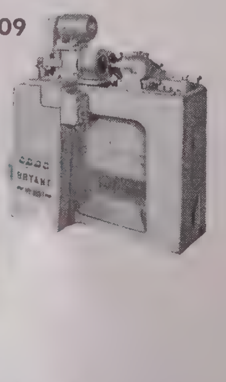


Internal Portable Thread Gage

Bryant thread gages, a few of which are shown, are built in many standard and special models to handle the inspection on a wide range of threaded parts. Segments for both external and internal gages are furnished to either GO or NOT GO thread form to "W" tolerances, thus accommodating all classes of fits. Capacities of standard bench models are 3/8″ to 5″ internal and 3/16″ to 5″ external; portable models are 7/16″ to 3″ internal. Write the factory for full information.

BRYANT INTERNAL GRINDERS

Series 150



Series 109

For 38 years Bryant has manufactured precision internal grinders. Today, the complete line covers machines for grinding holes from .040″ to 50″ in diameter. Standard and special machines will grind straight, tapered, curved and irregular holes, or any of these in combination. Face and hole grinding can be combined to assure squareness. Cams and irregular holes can be ground by using the Bryant cam tooling. Write to the factory for full details.

Bryant Chucking Grinder Co., Springfield, Vermont, U.S.A.

"Standard" Tubing Techniques

Automobile Propeller Shafts Demand a Tube that Won't Fail!

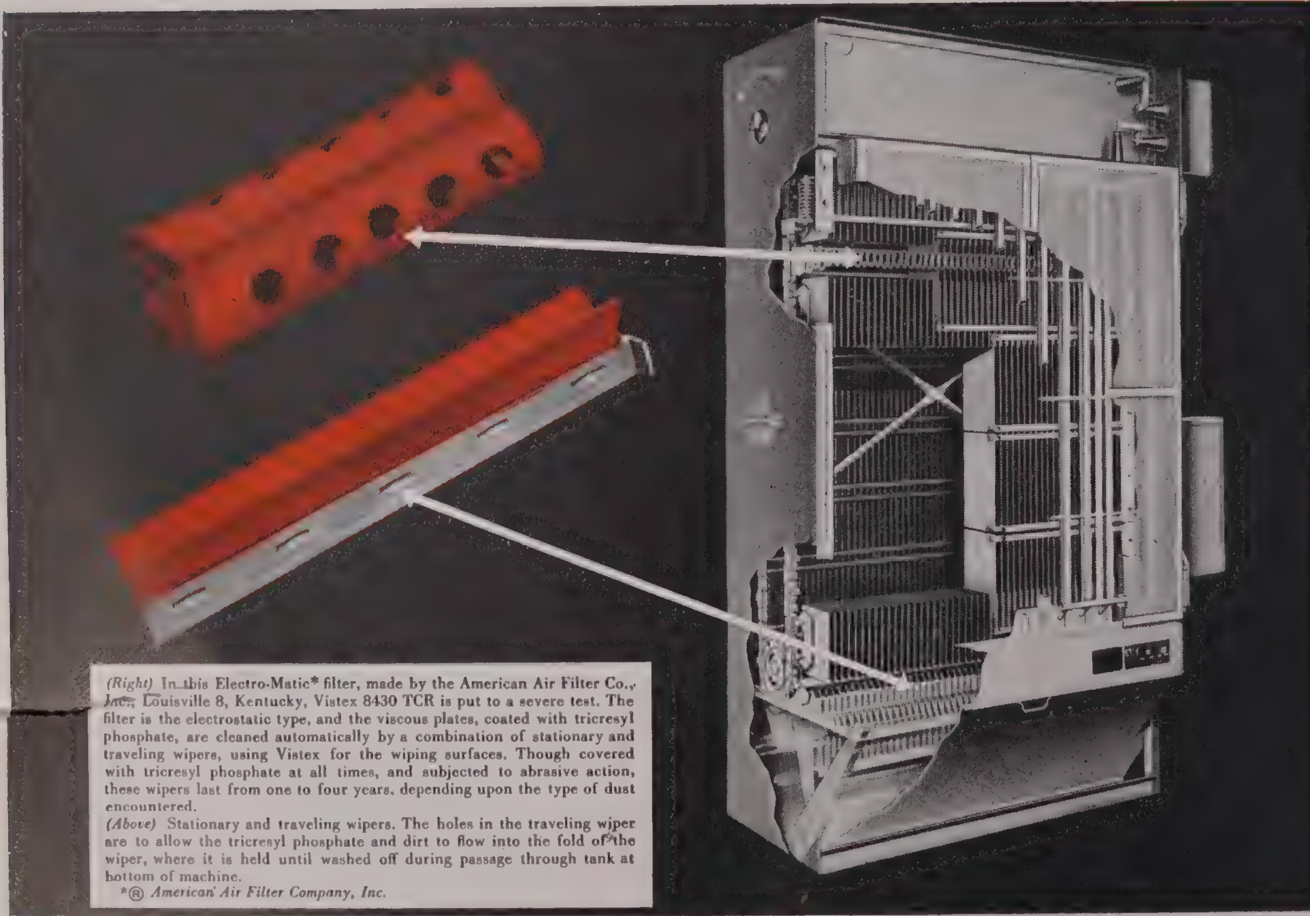
"Standard" electric weld tube is made to precision tolerances of gauge, diameter, ovality and straightness which gives almost perfect balance at high R.P.M. Made from high strength steel, every piece is hydro-tested to within 10% of the elastic limit of the steel assuring dependability and safety in operation. For expert workmanship and requirements that demand a tube of exacting specifications—

Specify "STANDARD"—it pays!

Sizes ½" O. D. to 5½" O. D., 22 B.W. G. to 3 B.W. G.

SEAL FOR TRICRESYL PHOSPHATE VISTEX

NEW TYPE OF PACKING, SEALING AND WIPING MATERIAL SUCCESSFULLY RESISTS ATTACK BY TRICRESYL PHOSPHATE.



(Right) In this Electro-Matic* filter, made by the American Air Filter Co., Inc., Louisville 8, Kentucky, Vistex 8430 TCR is put to a severe test. The filter is the electrostatic type, and the viscous plates, coated with tricresyl phosphate, are cleaned automatically by a combination of stationary and traveling wipers, using Vistex for the wiping surfaces. Though covered with tricresyl phosphate at all times, and subjected to abrasive action, these wipers last from one to four years, depending upon the type of dust encountered.

(Above) Stationary and traveling wipers. The holes in the traveling wiper are to allow the tricresyl phosphate and dirt to flow into the fold of the wiper, where it is held until washed off during passage through tank at bottom of machine.

*® *American Air Filter Company, Inc.*

THE increasing use of tricresyl phosphate in hydraulic systems and in other applications has led American Felt Company to produce a special type of Vistex that is practically immune to attack by this fluid. Sufficient experience in actual use has convinced engineers that Vistex 8430 TCR, is the perfect solution to the leakage and maintenance problems heretofore encountered in systems employing tricresyl phosphate.

What Vistex 8430 TCR Is. This material consists of high grade wool felt thoroughly impregnated with a special elastomer that is unaffected by tricresyl phosphate. The combination produces a material that is strong, tough, self-lubricating, highly resistant to wear, and unaffected by a wide range of conditions. Other standard types of Vistex were originated prior to the war to provide the high performance required of self-lubricating hydraulic shock absorber packings for automotive and military aircraft use.

Uses of Vistex. Packings, washers, heavy-duty bearing seals, gaskets, wipers—as in pumps, filters, die casting equipment, shock absorbers, valves, plungers, bearings, pistons.

Qualities of Vistex. It is strong, tough, highly resistant to wear and aging, self-lubricating, unaffected by a wide range of fluids and vapors that destroy other substances. Maximum operating temperature range, from −70° F. to 300° F. Because of the strength and toughness of Vistex, parts made of it can be removed and replaced without injury during maintenance operations.

How Furnished. Vistex is supplied either in 36" x 48" sheets, or in the form of cut parts. Thickness, from 1/32" to ½", standard tolerance plus or minus 0.010". Dimensions of cut parts are maintained within plus or minus 0.005". Vistex may also be molded to shape.

Four Types. There are four standard types of Vistex, impregnated respectively with Hycar, Neoprene, Buna S, and Natural Rubber. Other types, such as 8430 TCR, can be created for special purposes by selection of the proper impregnant.

Write for further information about this unusual material. Ask for Data Sheet No. 14.

American Felt Company

TRADE MARK

GENERAL OFFICES: GLENVILLE, CONN.
Engineering and Research Laboratories: Glenville, Conn. PLANTS: Glenville, Conn.; Franklin, Mass.; Newburgh, N. Y.; Detroit, Mich.; Westerly, R. I. SALES OFFICES: New York, Boston, Chicago, Detroit, Cleveland, Rochester, Philadelphia, St. Louis, Atlanta, Dallas, San Francisco, Los Angeles, Portland, Seattle.

How to be up in the chips

The extra tough, shock-resistant Carboloy standard tool in this turret lathe removes more than *five* tons of chips from steel forgings per tool grind . . . and steps up production to *three* times the former output.

300 lbs. of chips from a single forging —36 forgings per tool grind.

15-1/3 cu. in. of steel—nearly 4½ lbs. —removed per minute.

7½ plate cylinders (for printing presses) completely machined per 8 hour day.

1½" wide Carboloy standard tool takes 3 plunge cuts—2 minutes per cut—reducing shaft diameter from 6.5" to 3.99".

Tools are Carboloy grade 78-C . . . extra tough and shock-resistant.

It's easy . . . with Carboloy cemented carbides . . . but *only* carbide tools can give such fast, trouble-free machining.

CALL IN A CARBOLOY ENGINEER

Do you have a tough tooling problem? Tough or simple, a Carboloy engineer can help your engineers work out the use of carbides to your very best advantage . . . on just a single job or a complete plant tool-up.

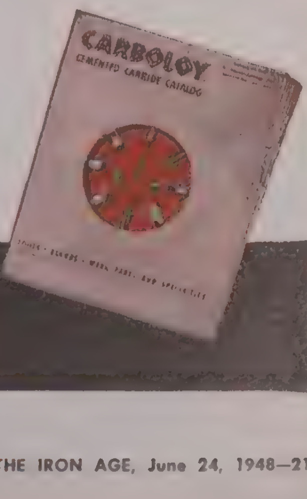
His technical knowledge of carbide tooling, and his experience in many varied types of problems, can help you with every stage of the job.

He can help you determine grades and styles of tools, cutting angles, depths of cut. And he'll know where there's an inexpensive Carboloy standard tool or blank to do the same job just as well—but do it for less.

So whether your job calls for any of Carboloy's 600 standard tools or blanks, or for a special Carboloy tipped tool (available through over 150 tool manufacturers)—ask your Carboloy man to call on you. Write for your copy of Carboloy's Catalog GT-200, too. *Carboloy Company, Inc., 11153 E. 8 Mile Ave., Detroit 32, Mich.*

AUTHORIZED CARBOLOY CEMENTED CARBIDES DISTRIBUTORS

Standards stocked by authorized distributors in 82 cities, coast to coast.



CARBOLOY®
CEMENTED CARBIDE

CALUMET
IRON & SUPPLY
COMPANY
EAST CHICAGO, INDIANA

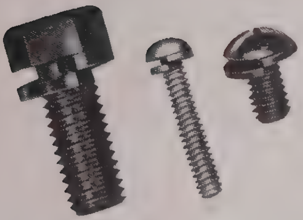
STRUCTURAL STEEL
PLATES
PIPE
TUBING
STEEL ERECTORS
& DISMANTLERS
STEEL FABRICATION
RAILROAD MATERIAL

CALISCO
SINCE 1926

CALUMET IRON & SUPPLY COMPANY • *EAST CHICAGO, INDIANA*

3 Fastening devices that cut costs . . . improve products and their serviceability

EATON SPRINGTITES CUT ASSEMBLY AND PRODUCTION COSTS



Quality Reliance Spring Lock Washers preassembled on bolts or screws . . . reduce assembly time . . . easy to use in hard-to-get-at places. Washer can't come off . . . eliminates losses . . . prevents use of the wrong washer. Write for Bulletin 200.

RELIANCE SPRING LOCK WASHERS FOR ALL BOLTED ASSEMBLIES

Reliance Spring Lock Washers are made from cold drawn spring steel. They act as hardened thrust bearings, making possible tighter assemblies . . . possess adequate calibrated tension to keep bolted assemblies *tighter longer*. A type for every requirement. Write for Bulletin 5A.

RELIANCE SNAP RINGS REDUCE COSTS . . . SAVE TIME AND MATERIAL

Used as synthetic shoulders for bearing on shafts or in counterbores, they enable you to save material . . . reduce machining costs . . . speed up production. Open or welded . . . Any cross section or end cut. Write for Bulletin 43.

Reliance Division

EATON
EATON MANUFACTURING COMPANY

OFFICES AND PLANT **MASSILLON, OHIO**

Sales Offices: New York • Cleveland • Detroit • Chicago St. Louis • San Francisco • Montreal

DIES LAST LONGER ON FERRACUTE INCLINABLE PRESSES

Extra long gibs guide tools accurately, give extra long life for dies.

Unusually heavy frame reduces deflection, lengthens die life . . . .

Check these additional features that will lower your costs:

- *Ferracute low-maintenance clutch.*
- *Adjustable ground gibs and ram.*
- *Ample shut height.*
- *Safety flywheels.*
- *Quick application of standard roll feeds.*
- *Back shaft equipped with roller bearings on larger presses.*
- *Bronze bushed.*
- *Air ram balance can be applied easily.*
- *Quick, easy change-over from single stroke to continuous operation.*
- *Immediate or very prompt delivery.*

Ferracute Presses "never wear out." You can figure on lower maintenance on every set of dies you buy in the next 50 years. Choose economical, low-maintenance Ferracute Inclinables for your utility press line-up. For cutting, punching, blanking, stamping, shallow drawing and forming. Models from 5 to 150 tons.

- *Write for full specifications and information.*

FERRACUTE MACHINE CO., Bridgeton, N. J., U. S. A.

Leadership at work!

ONE of **16** COIL FURNACES installed in a large Midwestern plant—

plus

10 FLAT SHEET FURNACES installed at the same time

SWINDELL-DRESSLER

RECIRCULATING RADIANT TUBE

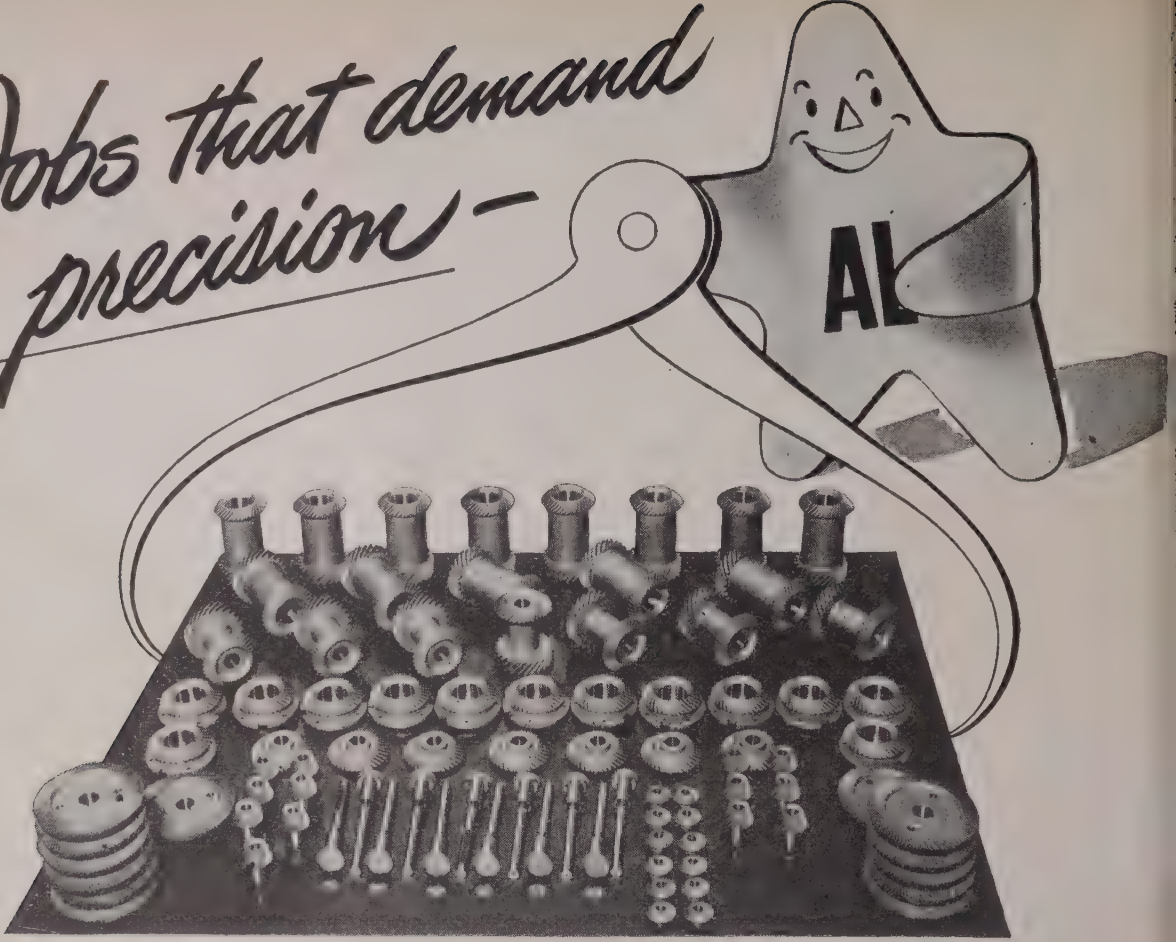
SHEET ANNEALING FURNACES

In this large Swindell-Dressler installation, each 40-tube furnace is capable of annealing eight stacks per base of sheet steel in 72″ O.D. diameter coils, stacked 150″ high—aggregating 600 tons of metal per heat.

Let a Swindell-Dressler Engineer consult with you regarding your particular furnace requirements—on any scale, anywhere.

SWINDELL-DRESSLER Corporation
DESIGNERS AND BUILDERS OF MODERN INDUSTRIAL FURNACES
PITTSBURGH 30, PA.

Jobs that demand precision –



–they're the jobs for DEWARD Oil-Hardening Tool Steel

For Complete Data, write for the DEWARD BLUE SHEET

Contains full information, certified as laboratory tested and proved, on the physical properties and characteristics of DEWARD Tool Steel, and best methods of handling and treatment. *Send for your copy.*

ADDRESS DEPT. A-65

Wherever your specifications call for hardened machine parts in precision work, you'll gain greatest advantage by using DEWARD Oil-Hardening Tool Steel—famous for its freedom from distortion after heat treatment.

This quality caused the selection of DEWARD for the complete set of precision gears illustrated above, which must run absolutely true in operation. After grinding, the gears are heat treated at 1425-1500° F., oil-quenched and then drawn at 750° F., resulting in a hardness of 48-51 Rockwell C. With no distortion, the final regrind and lapping of the bolt before assembly becomes a simple, quick, low-cost operation.

For any jobs of this general nature, let us show you how DEWARD can save you time and money in production, give you a better finished job—*or both!* Our Mill Service Staff is at your command, without obligation.

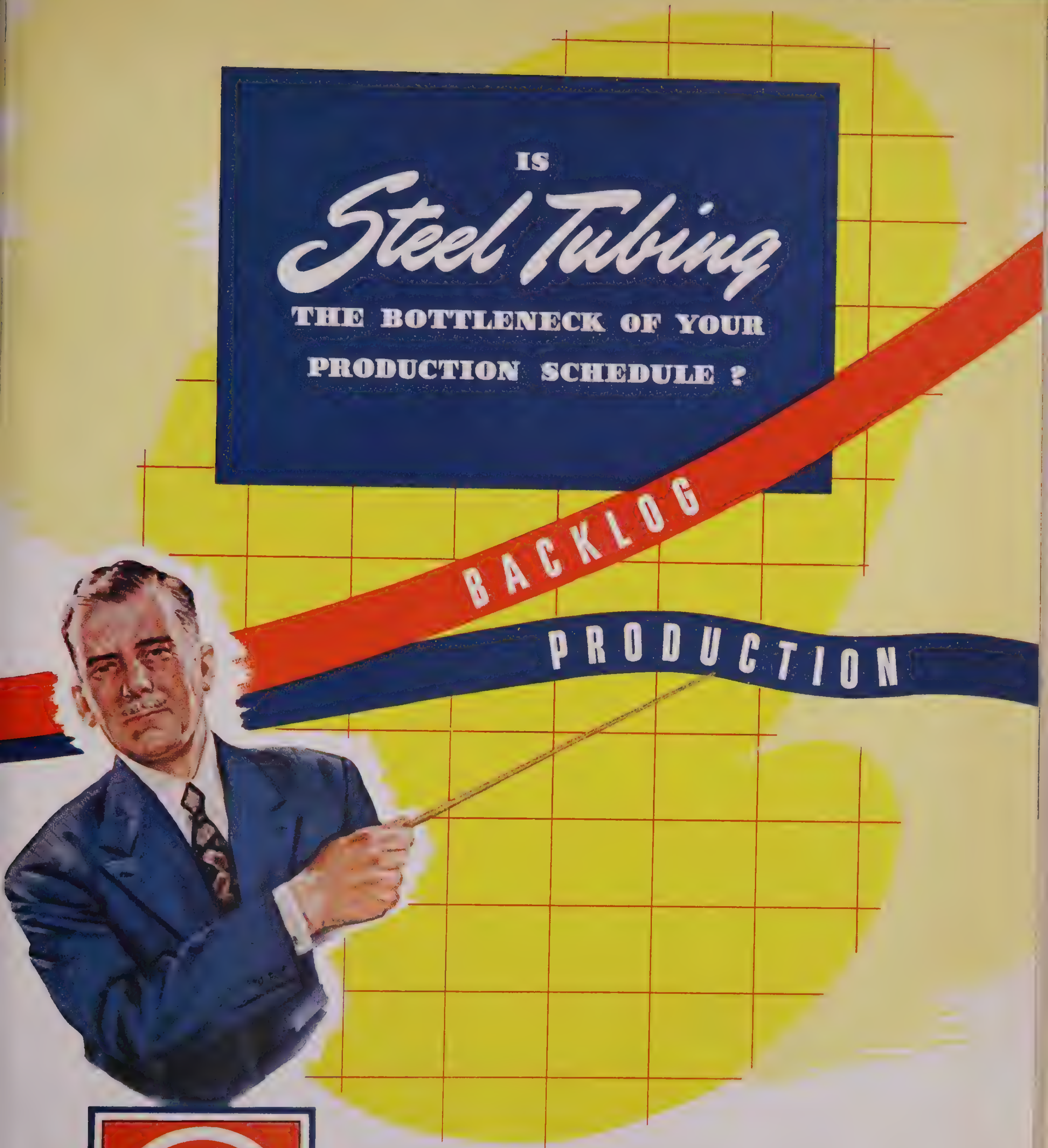
ALLEGHENY LUDLUM
STEEL CORPORATION
Pittsburgh, Pa.

TOOL STEEL DIVISION: DUNKIRK, N. Y.

Fine Tool Steels Since 1854

AL

W&D 1779



NIKOH

offers new facilities for manufacturing high-quality, welded-steel tubing, pipe, electric conduit. (See next page.) If you can supply your own steel, we will fabricate to your specifications in any desired quantity. Nikoh Tube Co., 5001 S. Kedzie Ave., Chicago 32, Ill.

NIKOH

NIKOH products are fabricated with the latest type Yoder automatic machines . . . all orders carefully inspected and tested before shipment.

Nikoh Tubing meets all standard specifications for diameter, concentricity, wall thickness, and finish. Our efficient manufacturing and handling methods assure low production costs.

ELDED STEEL TUBING . . .

A smooth, uniform product of accurate size. Available in round, rectangular, and other regular and irregular sections. Outside diameters from ½″ to 4″.

ELDED STEEL PIPE . . .

Available in all standard sizes from ¾″ to 6″ID.

LATED THIN WALL LECTRIC CONDUIT . . .

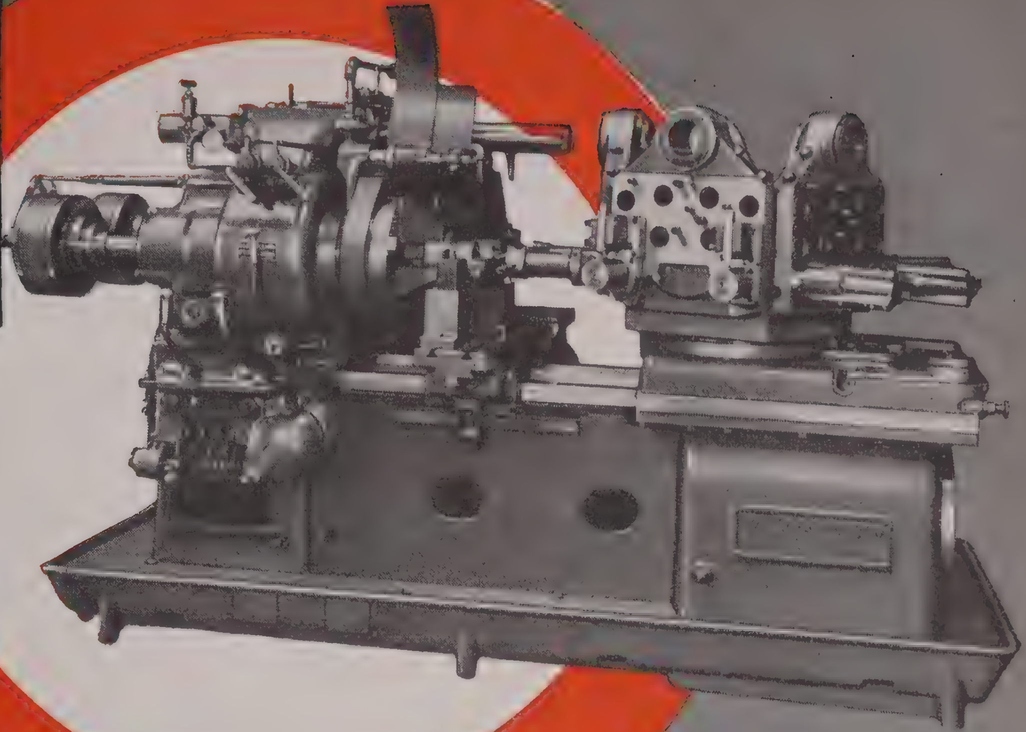
in standard sizes from ½″ to 2″.

Our plant has a potential output of several thousand tons per month, enabling us to give prompt service on the largest orders. We are especially interested to hear from manufacturers who can supply their own steel.

NIKOH TUBE COMPANY

5001 S. Kedzie Ave. • Chicago 32, Ill.

5D2



Output *Beyond the Capacity of a Single Spindle Machine is assured with the* P & J 5D2 POWER-FLEX

When requirements call for output in excess of that possible from a single spindle machine, the P&J 5D2 Spindle Power-Flex Automatic Turret Lathe is the logical answer.

This Model is available in 9", 12" and 15" headstock units. Power, great rigidity, four automatic changes of spindle speed while under cut, three selective automatic changes of feed and automatic binding of turret following index are provided. Maximum production is further assured by a powerful cross slide action and a constant high speed motion to cross slide and turret slide.

The cost-cutting possibilities of this machine are such as to warrant your asking P&J Methods Engineers to study your production problem and offer recommendations.

For more complete information send for catalog IA-25A

CONDENSED SPECIFICATIONS

	5D2-9"	5D2-12"	5D2-15"
Swing over bed	21½"	23"	28"
Cross Slide Travel (each way)	5"	5"	5"
Turret Faces	5 (4&6 Special)	5 (4&6 Special)	5 (4&6 Special)
Turret Feed	11"	8"	8"
Dist. between Spindles	10½"	15½"	15½"

Other
P&J
Automatic Turret Lathes

Model 2U
[illegible]

Model [illegible]
[illegible]

Model [illegible]
[illegible]

Model [illegible]
[illegible]

Model [illegible]
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Model [illegible]
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POTTER & JOHNSTON COMPANY
PAWTUCKET, RHODE ISLAND

Pratt & Whitney

Industry's $6 Billion Problem

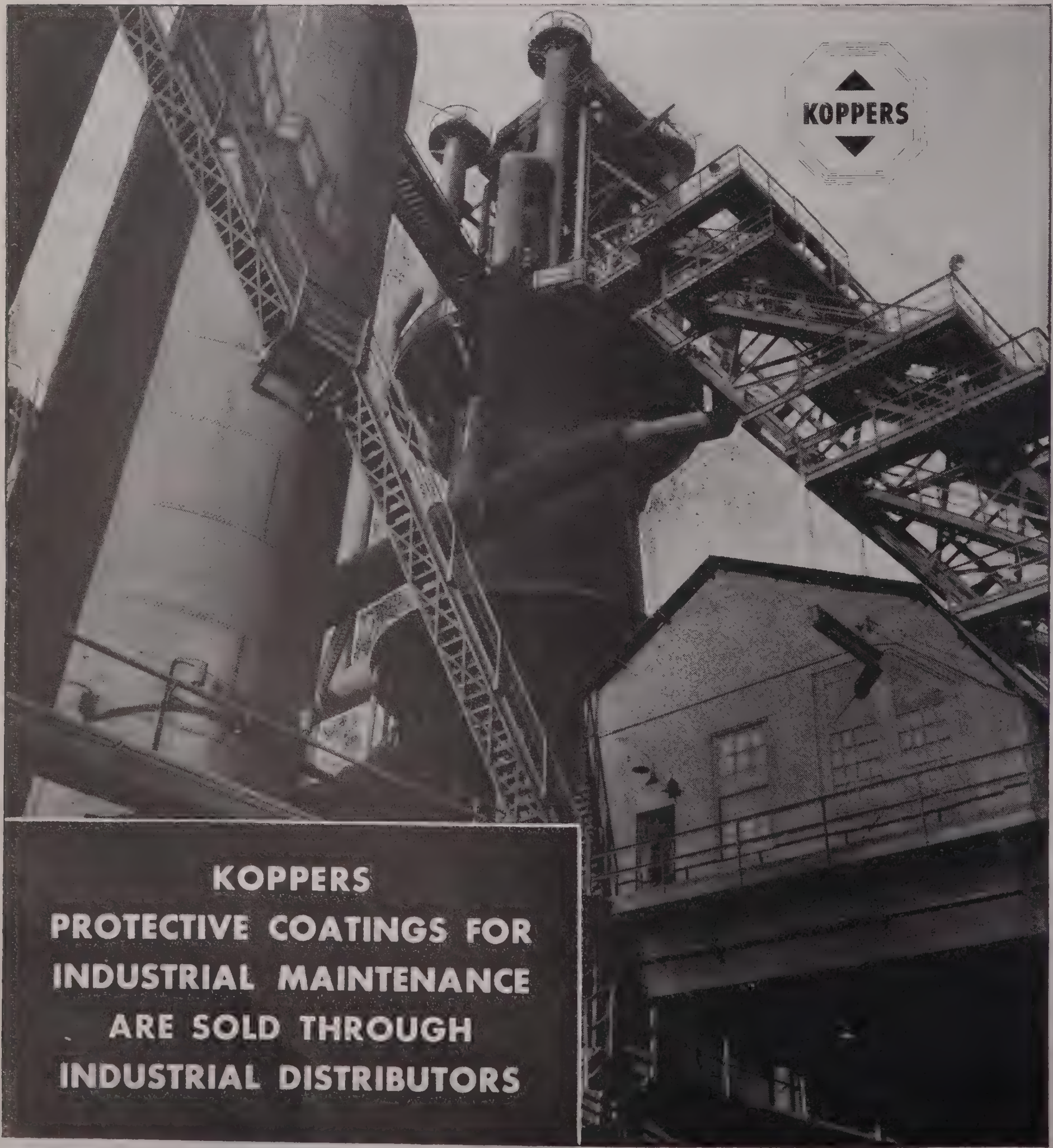
Rust, corrosion and deterioration take an estimated $6,000,000,000 annual toll. Much of this loss can be prevented by the use of corrosion-resistant equipment and protective coating materials.

Koppers is one of the largest manufacturers of specialized coatings to protect metal, concrete and masonry. These coatings are waterproof, resistant to chemical fumes, sunlight, and industrial atmospheres. They have an unequalled performance record in virtually every industry. Application requires no special skill.

Koppers Protective Coatings include: Bituplastic,* Bitumastic No. 50, Bitumastic Super-Service Black, Bitumastic Tank Solution, Bitumastic Black Solution, and Bitumastic Hi-Heat Gray.

*Trade Mark Reg. U.S. Pat. Off.

KOPPERS COMPANY, INC. DEPARTMENT 606T
PITTSBURGH 19, PA.



Preparing the mold for casting Phoenix Alloy Steel Rolls

PHOENIX ROLLS FOR THE BLOOMING MILL

Whether of plain carbon steel for extreme strength, or of Phoenix "A" Alloy Steel where unusual wearing qualities are desired, Pittsburgh rolls will produce blooms, billets, and slabs *at less cost per ton of steel rolled.*

P.R.W

PITTSBURGH ROLLS

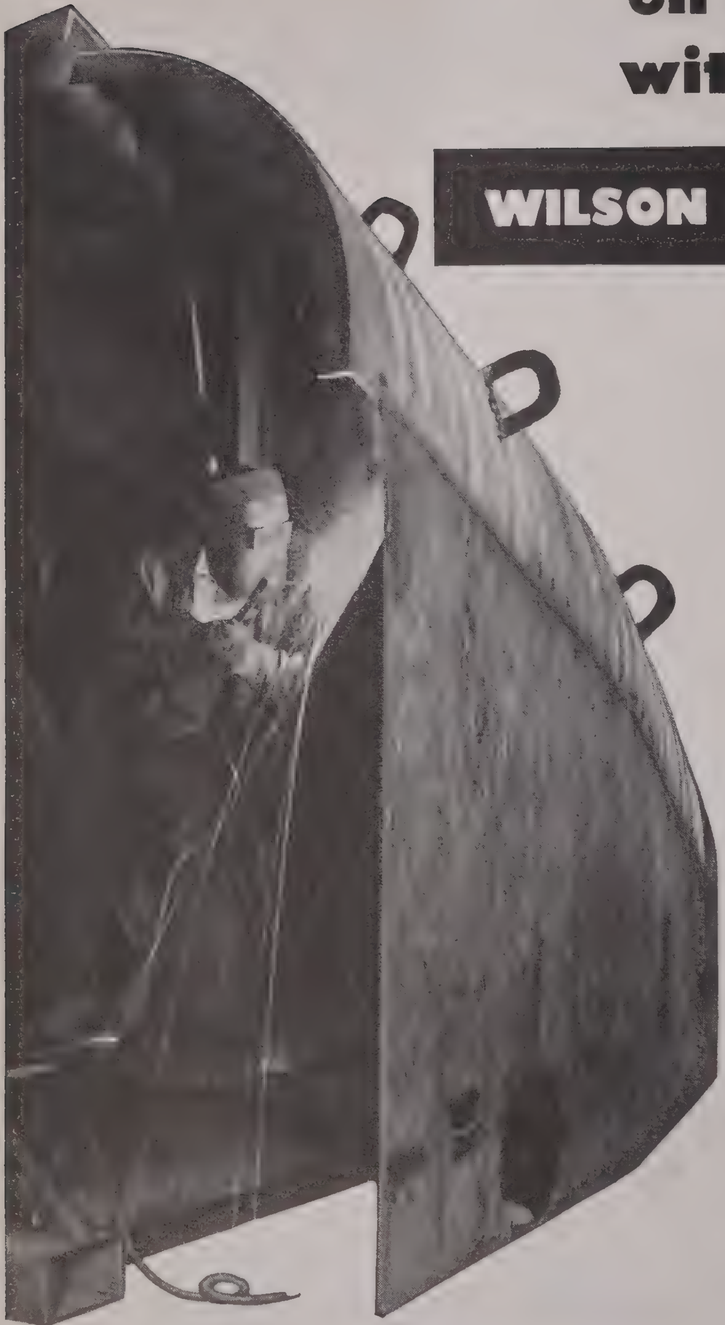
DIVISION OF BLAW-KNOX COMPANY, PITTSBURGH 1, PENNSYLVANIA

Faster Welds...Better Welds on Mild Steel with the New

WILSON No. 109

Electrode

(A.W.S. Class. No. E 6012)



The NEW Wilson No. 109 Electrode was developed to fill a definite industry need for a better electrode of the E6012 class, with the following specific characteristics. The NEW Wilson No. 109 has ALL of these features:

HIGH HEAT. Maintains a high degree of welding performance throughout the entire length of the electrode, even when high welding currents are used.

ALL POSITION. An all position electrode . . . it is especially good for welding vertically down.

OPERATING CURRENT. Excellent operating characteristics are obtained with either A.C. or D.C.

LOW SPATTER. A minimum of spatter compared to other electrodes in the same E6012 classification.

LONGER FILLETS PER ELECTRODE. Produces a bead of flat contour on fillet welds . . . *linear inches of weld produced per electrode are greater than for the average E6012 electrode.*

GOOD WELD APPEARANCE. Deposited bead is strong, smooth, and of proper contour.

EASY SLAG REMOVAL. Slag is exceptionally easy to remove.

Wilson Arc Welding Electrode Catalog ADW-75 gives complete information on the No. 109, as well as all the other electrodes which make up the Wilson line. For your free copy, fill in and mail the coupon below to us, or to your nearest Wilson distributor.

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Please send me a copy of Wilson Electrode Catalog No. ADW75, together with the latest electrode price list.

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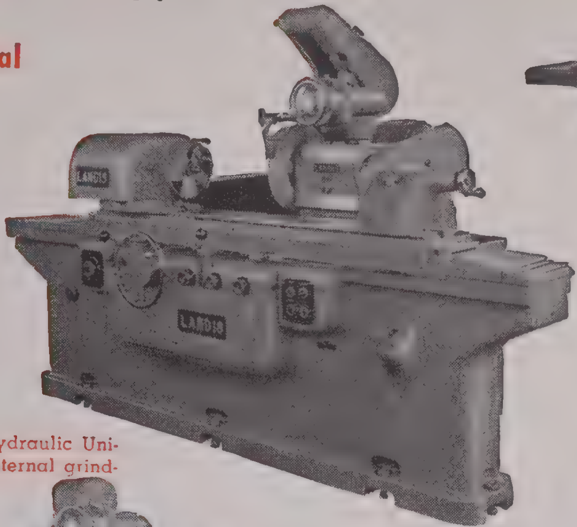
XII

LANDIS TOOL universal grinders

for these precision grinding jobs

straight cylindrical
shoulder
taper
face
internal



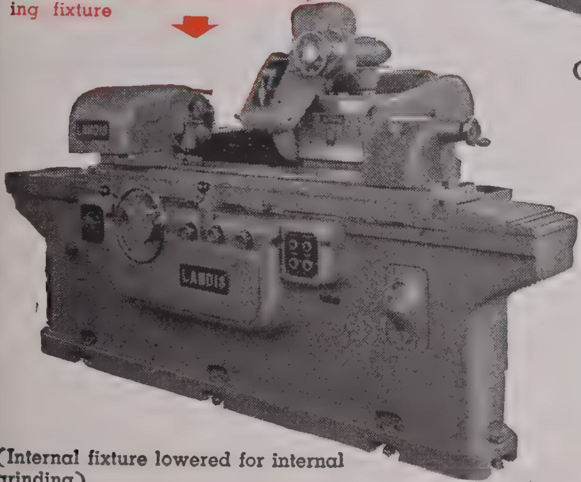
12" x 36" Type LCH Hydraulic Universal equipped with internal grinding fixture

(Internal fixture raised for external grinding)

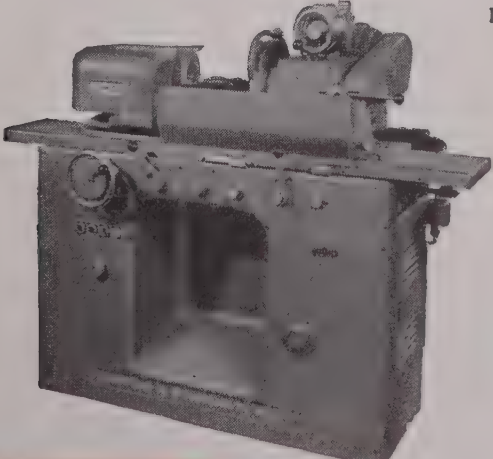
12" x 28" Universal & Tool

	Variable Speed Headstock Drive	Microsphere Spindle Bearings	Hand and Automatic Wheel Feed	Hydraulic Table Traverse	Two Speed Hand Traverse
*12" x 28" Universal & Tool	✓				✓
10" x 20" Type H Hydraulic Universal	✓	✓	✓	✓	✓
10" x 24" Type CH Hydraulic Universal	✓	✓	✓	✓	✓
12" Type LCH Hydraulic Universal	✓	✓	✓	✓	✓
14"—18" Type C Hydraulic Universal	✓	✓	✓	✓	

*The 12" x 28" Universal and Tool is equipped with precision anti-friction spindle bearings, adjustable mechanical table traverse and coarse and fine feed for the grinding wheel.



(Internal fixture lowered for internal grinding)



10" x 20" Type H Hydraulic Universal

LANDIS TOOL

Precision Grinders

IS TOOL COMPANY • 14 EAST SIXTH ST. • WAYNESBORO, PA.

10" x 24" Type CH Hydraulic Universal

FACTS WORTH NOTING

TITANIUM ALLOYS
USED in steel making

TAM High Carbon Ferro Titanium is used as ladle addition to rimming steel for improvement of rimming action. It is a favored ladle addition in steel casting practice for proper deoxidation and soundness, and in forging steel for cleanliness and uniformity.

TAM Medium Carbon FCT is used as a ladle addition by producers of low carbon sheet, strip, plate steel and tin plate. The alloy aids in producing thick skinned ingots resulting in fewer cracks on rolling.

TAM 40% Low Carbon Ferro Titanium is a very effective deoxidizer. It is also used in steels where a residual titanium content is desired. Applications are for vitreous enameling steel, stabilization of stainless steels (type 321) and in heat resisting alloys. In these steels, Titanium prevents carbon from combining with other elements, prevents intercrystalline embrittlement in stainless steel and improves resistance to scaling and air hardening in chromium steel.

TAM Steel Foundry Ferro Titanium is a highly efficient deoxidizer, and an effective source of titanium as an alloy addition, for certain grades of low alloy steels. In these steels a residual titanium content improves weldability.

TAM Iron Foundry Ferro Titanium is used as a deoxidizer, grain refiner and graphitizer for cast iron where it is very effective in reducing the size of the graphite flakes.

TAM Carbortam is the most economical boron-containing Titanium alloy and is used in increasing quantities in steels where increased hardenability, good ductility, and superior toughness after hardening and drawing at low temperatures are desirable. It has also found considerable use as a deoxidizer for cast steel.

TAM Manganese Titanium is used as a deoxidizer in high grade steel or nonferrous alloys where the oxides produced must be especially fluid and flux silicates effectively. It is beneficial also as an ingredient in welding rod coatings.

TAM Nickel Titanium is used in welding rod coatings, and as a source of Titanium for nickel alloys.

COMPOSITION OF TITANIUM ALLOYS USED IN STEEL MAKING

PERCENTAGE	High Carbon FCT	Medium Carbon FCT	Low Carbon Ferro Titanium	Steel Foundry Ferro Titanium	Iron Foundry Ferro Titanium	Carbortam	Manganese Titanium	Nickel Titanium
TITANIUM	15-18	17-20	38-42	25-27	19-21	15-17	25-28	25-28
TOTAL CARBON	6-8	3-5	0-.1	0-.1	0-.05	6.5-7.5	0-.1	0-.1
GRAPHITE	2-4	0-.1						
SILICON	2-3	2-3	3-5	20-24	19-21	2.5-3.5	2-4	1-3
ALUMINUM	1-2	1-2	6-9	0.5-1	0-1	1-2	7-9	6-8
MANGANESE	0-1	0-1			0-1		35-40	
IRON	70*	70*	47*	50*	57*		20-25	2-5
SULPHUR	0-.1	0-.1			0-.1			
PHOSPHOROUS	0-.1	0-.1			0-.1			
NICKEL								60-65
BORON						.9-1.15		

*Approximate balance of composition

These regular Titanium Alloys are stocked to facilitate prompt shipment. Packaged to accurate weights, they help expedite use. Other special alloys are also available in 600 lb. or more lots for experimental and metallurgical use. To assist in meeting your requirements correctly, an adequate staff of chemists, metallurgists and technicians man our modern laboratories. In the field, qualified engineers welcome the opportunity to assist and cooperate with your staff.

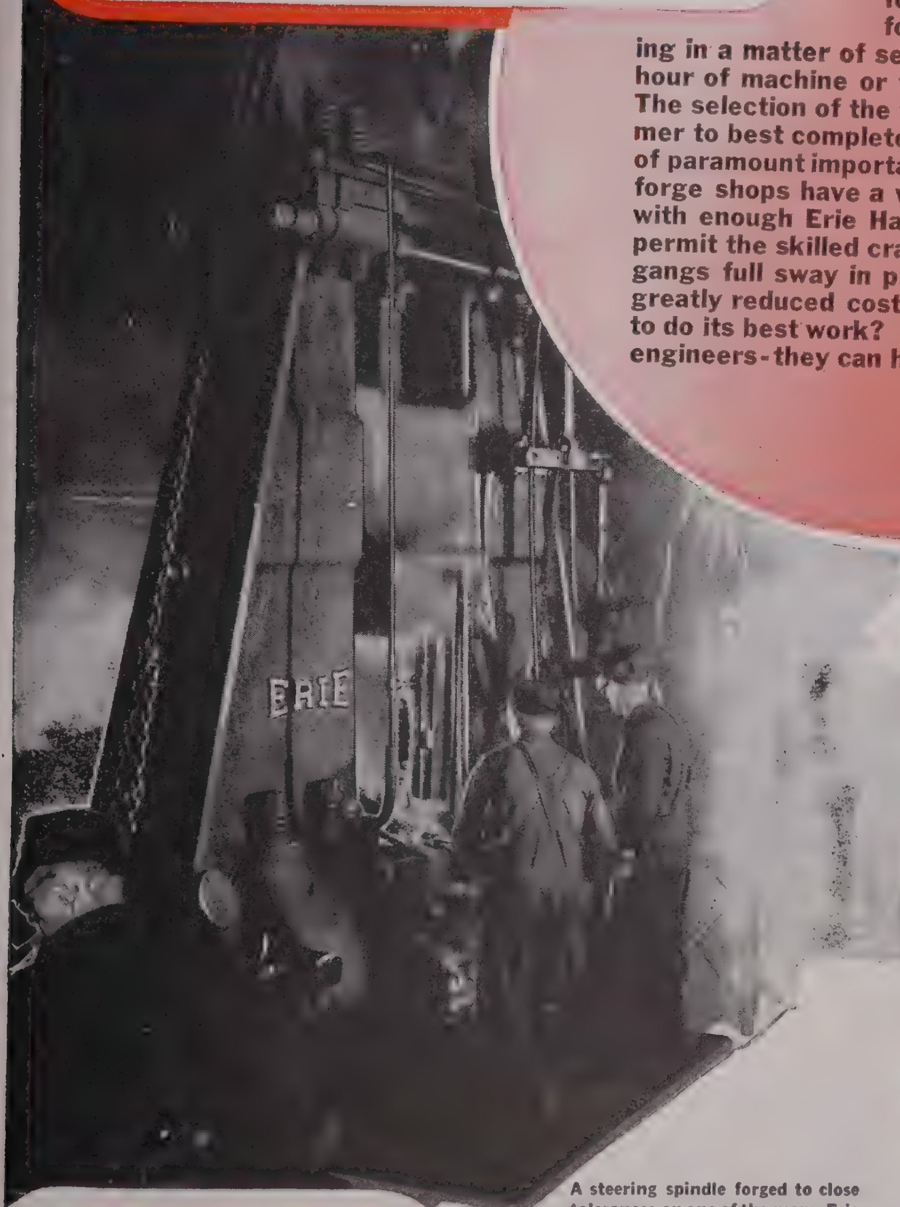
TAM

TITANIUM ALLOY MANUFACTURING COMPANY

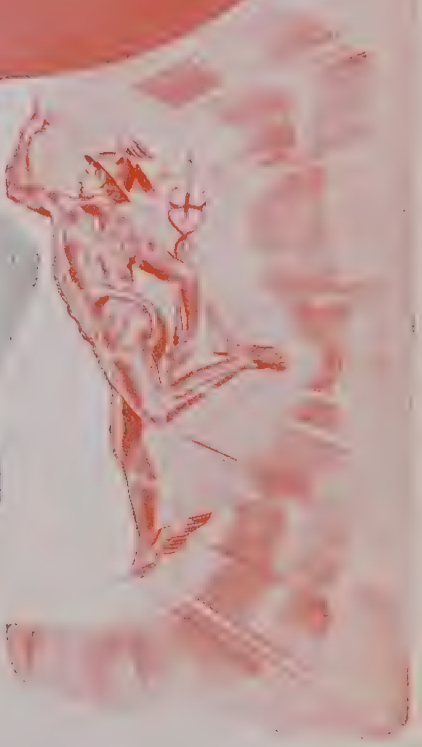
Executive Offices: 111 Broadway, New York City   General Offices and Works: Niagara Falls, N. Y.

Where 60 Seconds May Gain 1 Hour ~

ERIE STEAM HAMMERS in the modern forge shop, matched by the skill of the hammergang, achieve uniformity of size and shape in forming the average forging in a matter of seconds . . . as much as an hour of machine or finish time is thus saved. The selection of the type and size of Erie Hammer to best complete the forging job in hand is of paramount importance. Many Erie-equipped forge shops have a wide variety of capacities with enough Erie Hammers on instant call to permit the skilled craftsmen in these hammergangs full sway in producing finest quality at greatly reduced costs. Is your shop equipped to do its best work? Consult with Erie Foundry engineers - they can help you.



A steering spindle forged to close tolerances on one of the many Erie Steam Hammers at Transue and Williams Steel Forging Corporation, Alliance, Ohio.



All parts on Erie Hammers subject to impact, upper works, frames and anvil are steel.

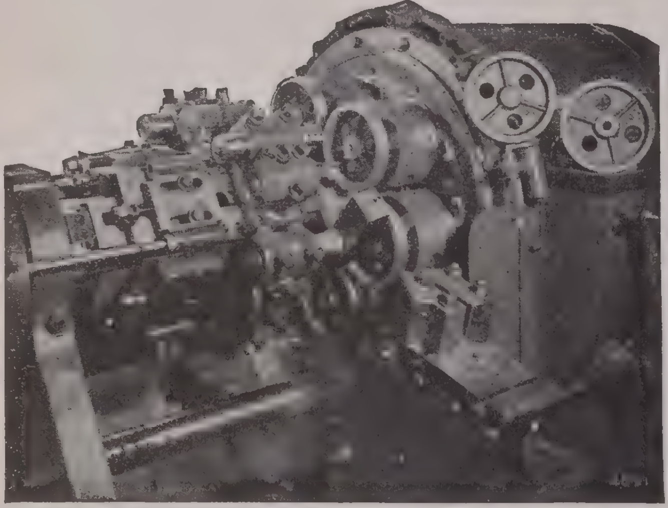
ERIE

ERIE FOUNDRY COMPANY, ERIE, PA.

ERIE BUILDS *Dependable* HAMMERS

FOR HIGH PRODUCTION OF WORK REQUIRING FINE FINISHED SURFACES AND TO CLOSE LIMITS.

BAIRD No. 76H CHUCKER



Here is shown a "Baird" #76H Chucking Machine, set up for turning, facing and boring gear Blanks made of a Special Cast Iron having a Rockwell hardness—85-90 B Scale.

The O.D. is finished turned to 6.800 plus or minus .001 and both faces are finished to 1.000 width, plus or minus .001.

The Hole is finished bored and reamed .750 diameter to plug gage and is concentric with the O.D. turning within .001 total indicator reading.

The work is held in Standard "Baird" Three Jaw Contracting Chucks, using stud type jaws for gripping. (The Spindle Turret is shown partially indexed to better illustrate the method of chucking.)

This gear is completely turned as shown to the required accuracy at the rate of 55 pieces per hour.

Some of the exclusive features which have made this "Baird" 7" six spindle horizontal indexing lathe outstanding are:

INDEPENDENT TOOL SLIDES. The longitudinal tool slides may have different strokes and the cross slides are independent and have their strokes, all as best suits the job. All tool slides have micrometer adjustment.

DIFFERENT SPEEDS AT SPINDLES. Ability to choose a speed for the spindle at each work station to suit the operation to be performed at that station permits of best product in least time.

AUTOMATIC CHUCKING. Operator has both hands free to handle the work. No levers or handles to require his attention or take his time.

ATTACHMENTS. Several readily applied attachments are available to perform extra operations and reduce handling, thus speeding production.

AUTOMATIC MECHANICAL STOP. This stops the machine at the end of each cycle if operator has not unloaded and reloaded in the proper operation of machine. This and other safety features make for least loss due to damage and for greatest safety.

When you have Turning Operations that should be done profitably

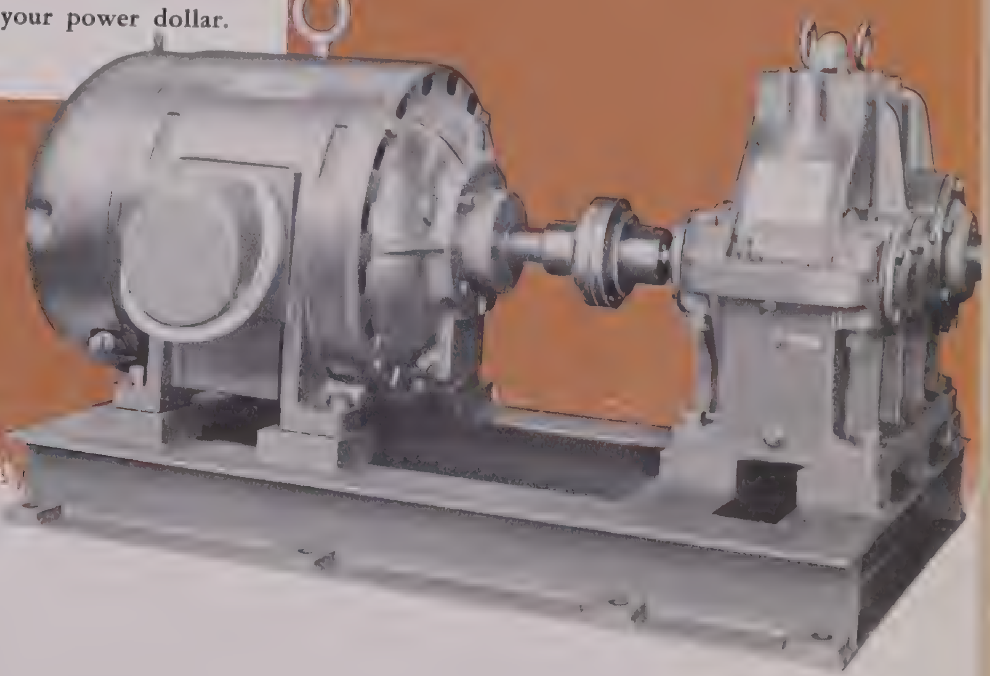
"Ask **BAIRD** *About It"*

THE BAIRD MACHINE COMPANY, STRATFORD 9, CONN.

USE THIS ONE SOURCE

FOR YOUR RPM REQUIREMENTS

Westinghouse offers the way to simplify your geared drive problems . . . to prevent headaches, save money, assure *more productive power.* Let Westinghouse geared-drive engineers take the responsibility for application, installation and performance . . . make certain you get the most in applied power for your power dollar.



FOR DRIVES UP TO 1,000 HP . . . USE WESTINGHOUSE SPEED REDUCERS—

For drives from 75 to 1,000 hp, speed reducers have no equal . . . and, in some instances, they're the best answer for drives below 75 hp, particularly when the prime mover is Diesel, gasoline or steam powered . . . or when existing installations dictate a separate speed-reduction unit. Westinghouse Speed Reducers are compact, fit closely to the machines they serve, have power efficiencies averaging 96% to 98%.

Continuous, trouble-free operation is assured by simplified design, exclusive Westinghouse BPT heat-treating of gears and pinions, positive lubrication and accurate construction.

A range of 28 standard ratios . . . from 2.82 to 70.5 . . . makes proper selection easy, and simplifies ordering and installation.

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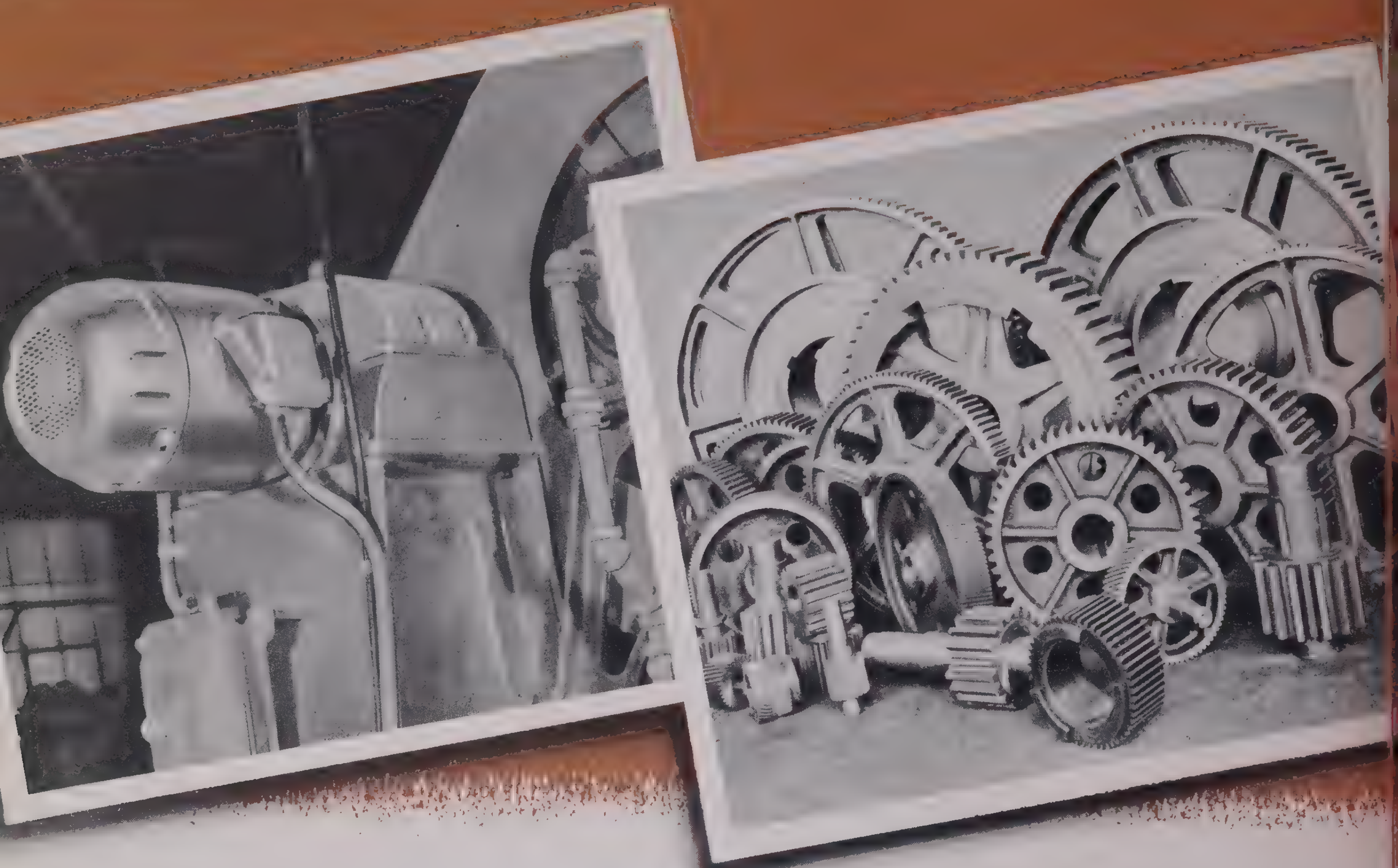
PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE



FOR DRIVES TO 75 HP, USE WESTINGHOUSE GEARMOTORS—

Westinghouse Gearmotors are today's best answer for obtaining speed reduction on drive applications from 1 to 75 hp.

In addition to providing speed reduction efficiency averaging 96 to 98%, they increase work-flow through savings in floor space . . . provide greater flexibility of machine arrangement, permitting better co-ordination of functions. Maintenance is reduced . . . drive hazards are eliminated as no moving parts are exposed. Motor and reduction unit are attached directly to the driven machine . . . installation is easy.

LET WESTINGHOUSE SOLVE YOUR INDUSTRIAL GEARING PROBLEMS—

Let Westinghouse geared-drive engineers save you the time and expense of figuring your open gearing requirements.

From application help to finished product, they are at your service.

Westinghouse has specialized facilities for the design, application and manufacture of spur, single-helical and double-helical gears . . . up to 10 ft. in diameter.

Prompt delivery can be provided in most types and sizes.

* * *

Depend on Westinghouse for help on your gearing problems. You buy undivided responsibility for design, manufacture and servicing of all electrical and mechanical components. Call your nearest Westinghouse office, or write for booklet B-3730. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-07263

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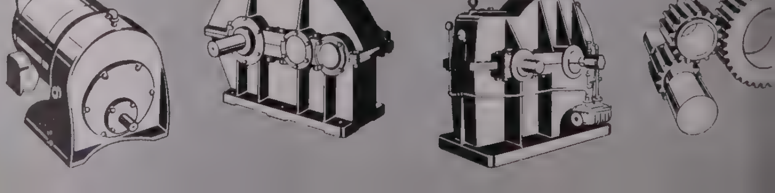
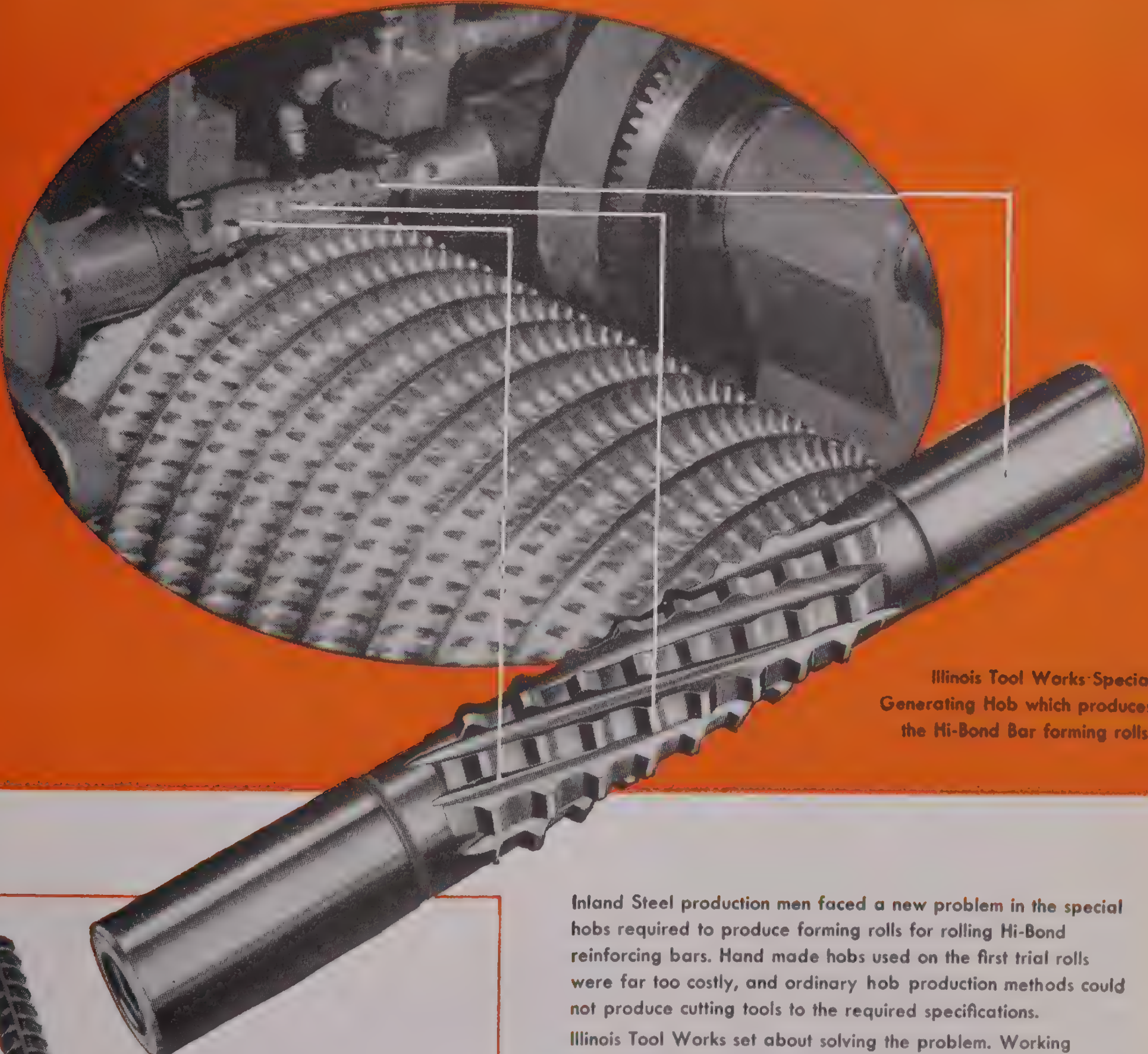
RPM FITTED DRIVES



nother "assist" for Illinois Tool



Illinois Tool Works Special Generating Hob which produces the Hi-Bond Bar forming rolls.

Inland Hi-Bond concrete reinforcing bars are produced to exacting dimensional standards by precision rolls like that shown being hobbed above. A set of two rolls, dressed and re-hobbed, will produce about 10,000 tons of finished Hi-Bond bars!

Inland Steel production men faced a new problem in the special hobs required to produce forming rolls for rolling Hi-Bond reinforcing bars. Hand made hobs used on the first trial rolls were far too costly, and ordinary hob production methods could not produce cutting tools to the required specifications.

Illinois Tool Works set about solving the problem. Working closely with Inland engineers, ITW specialists developed unique production and heat treating methods to deliver the required hobs . . . no simple task considering the hardness (400 Brinell) of the rolls to be hobbed.

These hobs for Inland Steel are typical of Illinois Tool Works cooperation in cutting tool development . . . typical of the economies that Illinois Tool Works can achieve for you. Call an ITW cutting tool specialist today!

**HEADQUARTERS FOR
ENGINEERED CUTTING TOOLS**

**ILLINOIS
TOOL WORKS**

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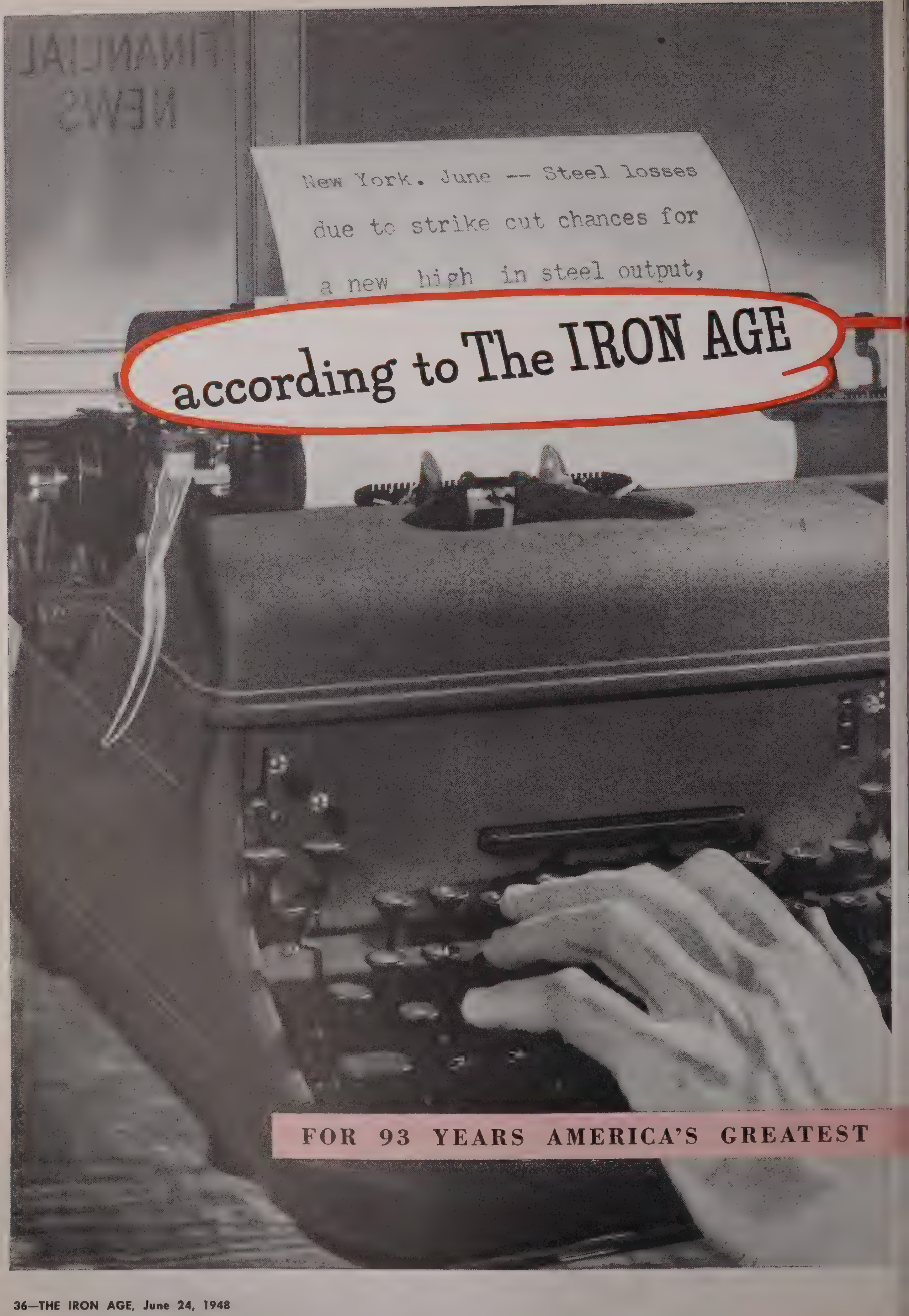

New York. June -- Steel losses due to strike cut chances for a new high in steel output,

Wire services and newspapers know What's News

That's why they use

The Iron Age Industrial News Summary for news of the Metalworking Industry.

Week after week, editors and radio commentators quote extensively from the Iron Age. Far more than from all other metalworking publications combined.

In the month of April, Iron Age was quoted in over 500 leading newspapers and in 56 or more radio newscasts.

(Actual count by a newspaper clipping bureau and a radio reporting service.)

Iron Age is basic in a basic industry.

1-2-3 Editorial leadership

reader interest . . . advertising effectiveness—each makes its contribution to the next. Advertisers recognize this powerful factor by using more pages in The Iron Age than any other magazine—including all general as well as business papers in the world.

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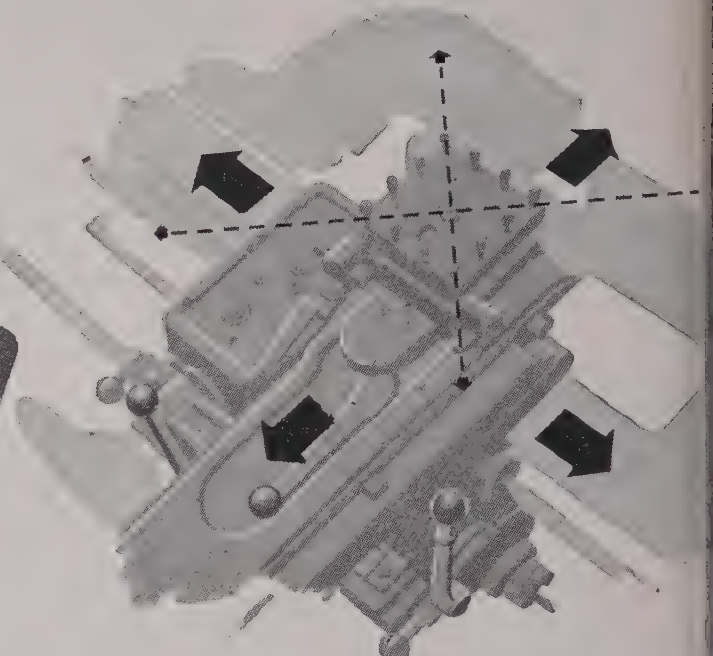
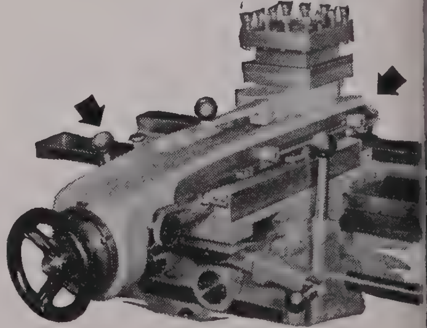
Exclusive Versatility

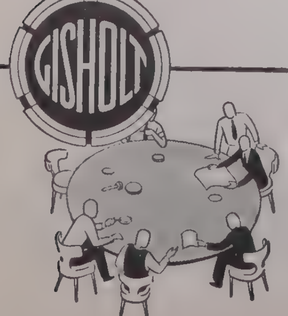


Power Rapid Traverses for side carriage and cross slide are controlled by dual levers, thus permitting them to move independently or together.

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin



Gisholt's more versatile power rapid traverse reduces time lag between cuts, speeds production, saves time and money. *This has been a standard Gisholt feature for over twenty years.*



THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS BALANCERS • SPECIAL MACHINES

"hold it, that Steel's Usable!"

"We tried to find some use for an off-size coil of steel . . . but gave it up for a bad job.

"Just as we were ready to throw it on the junk heap an old friend walked into the plant.

" 'Hold it!' he said, 'that steel's USABLE!'

"It was a Gensco representative. 'Sit tight while I give it a once-over,' he demanded.

"With his help, we salvaged a whole pile of steel we thought was useless, shipped it to Gensco, where they resized it to meet our exact requirements."

What to do with off-size sheets, strips and coils USED TO BE a problem.

But today, Gensco's amazing shearing, slitting, roller leveling and edging service puts off-size steel right where it belongs . . . back on the assembly line!

Remember . . . Gensco's men are eager to help you solve your special steel problems. Their assistance is as close as your telephone.

the Exact Steel for Your Individual needs

COLD FINISHED BARS • SHAFTING • TEMPERED AND ANNEALED SPRING STEEL • DRILL ROD • SHIM STEEL • COLD ROLLED STRIP STEEL • COILS AND STRAIGHT LENGTHS • ROUND EDGED STRIP STEEL • FEELER GAUGE • ROUND WIRES • STEEL BALLS

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America's Most Complete Line of

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FOR PLATE AND SHEET METAL WORK

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Ring and Circle Shear

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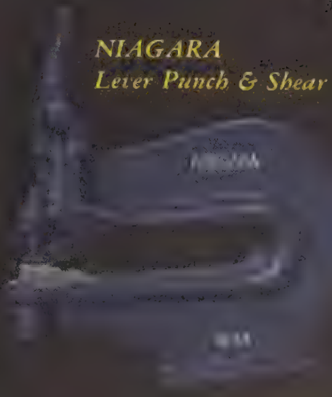
The tinners' tools and machines shown on these pages are just a few of the hundreds included in the complete Niagara line. There is an economical, productive and reliable press, shear, machine and tinners' tool for every requirement for sheet metal job shops, plant maintenance departments and high production plants. Niagara hand, foot and power operated machines offer low first cost, low production cost and low maintenance cost. Write for catalogs.

NIAGARA
Combination Bench Machine



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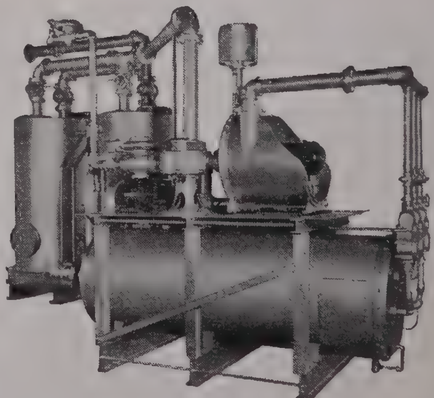
Use the coupon to let us know of your interest!

Supplies 15000 cu. ft. per hour . . .

for 15 to 20 sheet-annealing bases at a large steel mill. Protects low-carbon steel from the effects of both oxygen and water vapor through a 72-hour bright annealing cycle. Silica-gel desiccating towers dry to a dew-point of -40°F. Gas analysis: N_2 — 72%, CO_2 — 5.8%, H_2—12.1%, CO—9.8%, CH_4—0.2%, O_2—none.



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PRECISION CARBURETION + ADAPTED COMBUSTION FOR INDUSTRY'S HEAT-USING PROCESSES. ATMOSPHERE GENERATION & ADSORPTIVE DRYER SYSTEMS FOR PROCESS CONTROL AND PROTECTION

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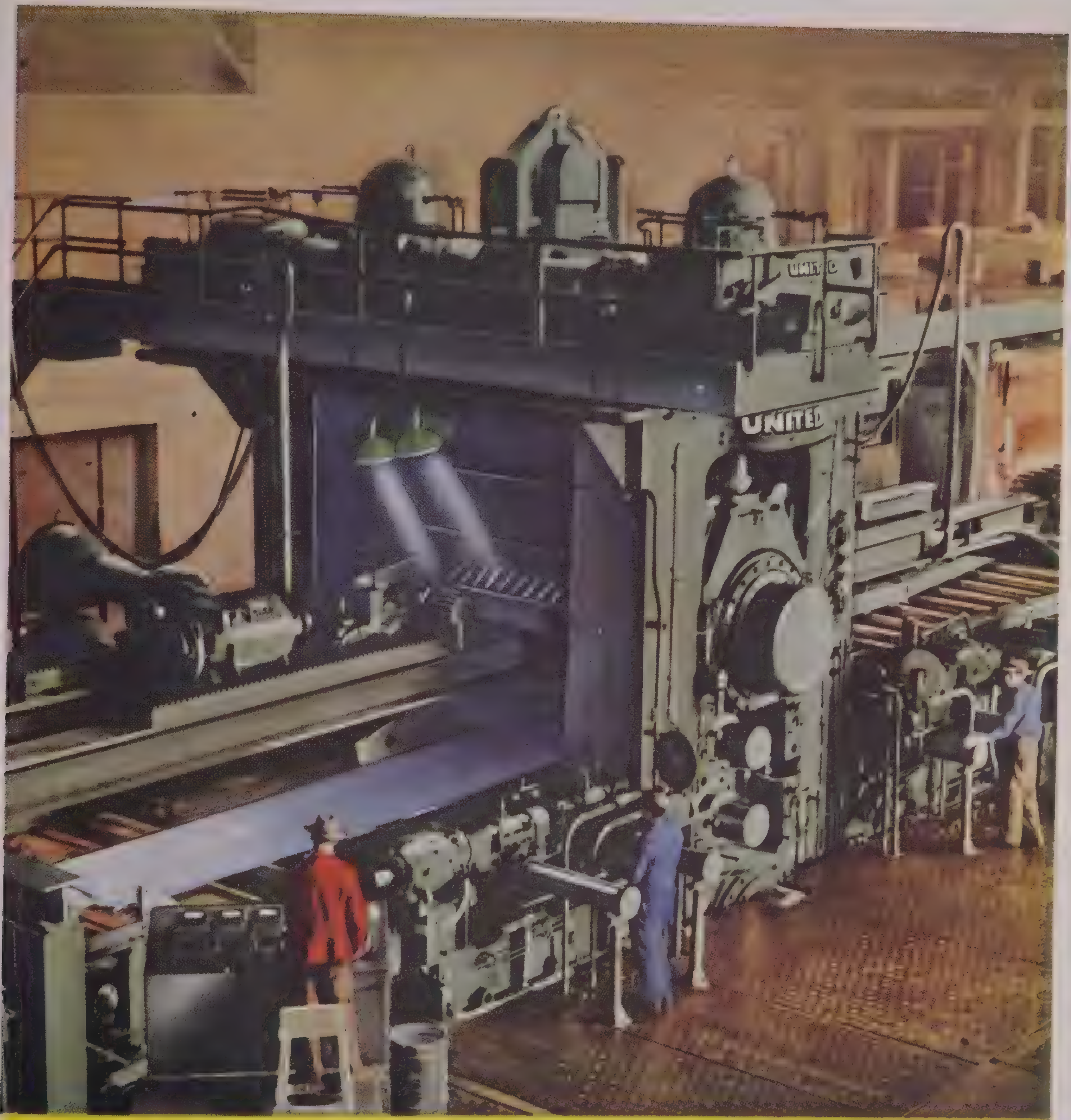
STREET ....

CITY .... ZONE ...... STATE ....



4 High Aluminum Rolling Mill

Designed and Built by

UNITED ENGINEERING and FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

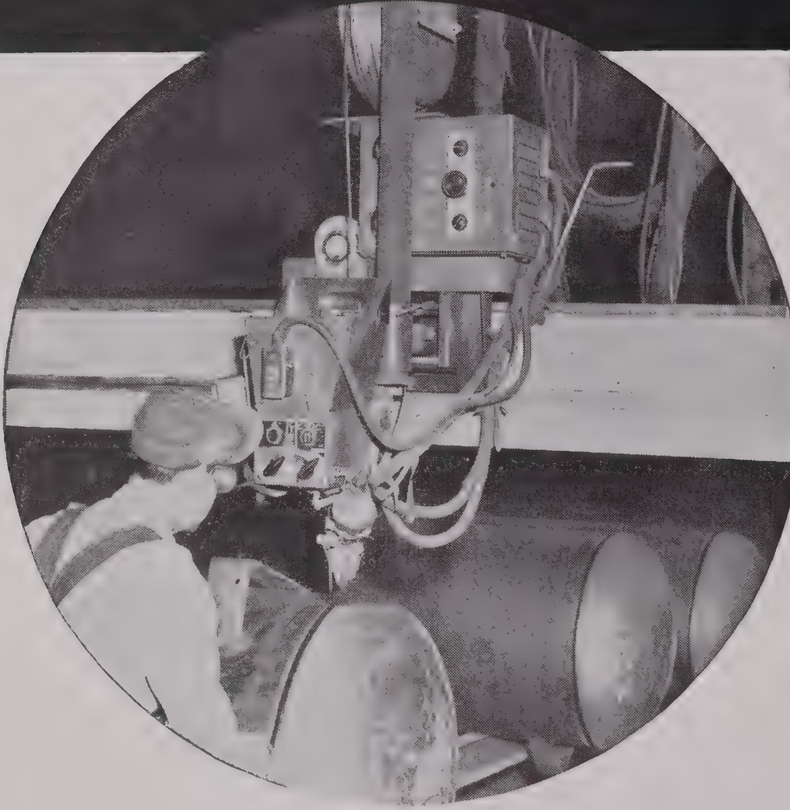
Plants at PITTSBURGH · VANDERGRIFT · NEW CASTLE · YOUNGSTOWN · CANTON

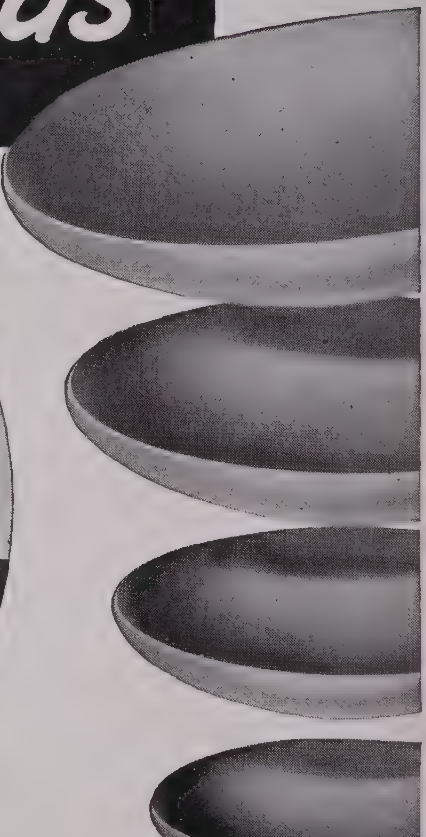
Subsidiary: Adamson United Company, Akron, Ohio

Affiliates: Davy and United Engineering Company, Ltd., Sheffield, England
Dominion Engineering Works, Ltd., Montreal, P. Q. Canada · S. E. C. I. M., Paris, France

Designers and Makers of Rolls and Rolling Mill Equipment

KEEP PRODUCTION MOVING SMOOTHLY WITH *Lukens Heads*





HEADS ARE AVAILABLE for immediate delivery from stock in many sizes of Standard and ASME Flanged and Dished Heads. For other styles and sizes, Lukens has hundreds of dies ready to be put to work producing the heads you need.

ACCURATELY DIMENSIONED, Lukens Heads help you speed production because fitting-up time is held to a minimum. They're shaped according to exacting specifications. Head sizes range from four inches to over twenty feet in diameter.

IN VARIOUS MATERIALS, TOO—Lukens makes heads of carbon and alloy steels, including stainless, of nonferrous metals and the widest selection of clad steels available anywhere. Select the metal you require and Lukens will make the heads.

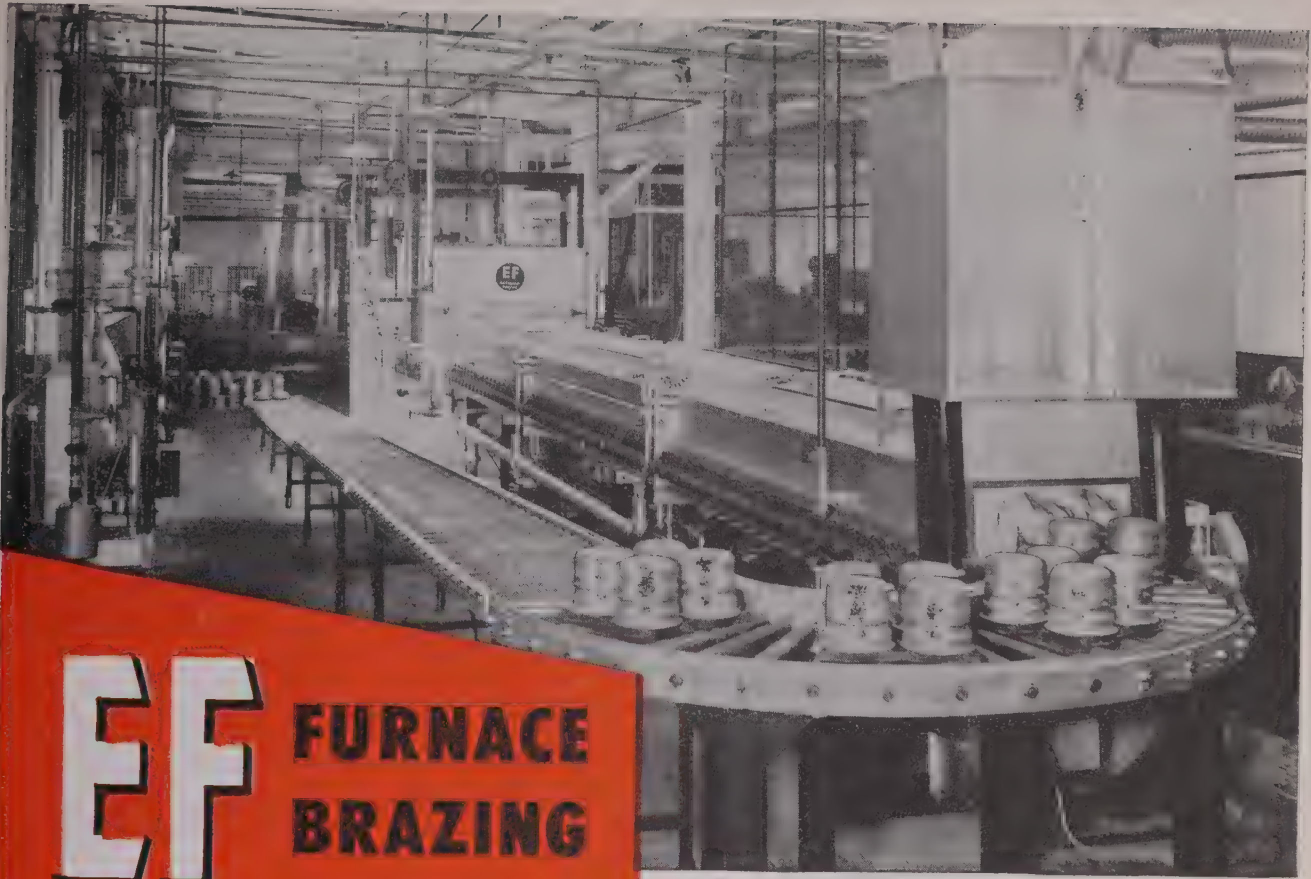
Catalog No. 1 describes 3,868 Lukens Heads. For a copy, write Lukens Steel Company, 413 Lukens Bldg., Coatesville, Pennsylvania.

"Head Work", a 16mm motion picture in sound and color, on spinning and pressing of Lukens Heads is available without charge. Running time: 27 minutes. Write for a booking date.

LUKENS
HEADS

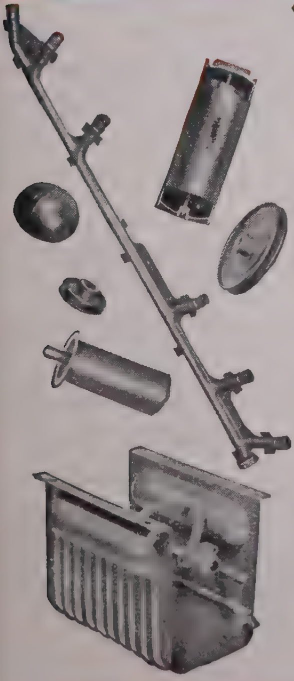
FOUR INCHES TO OVER TWENTY FEET IN DIAMETER

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •



EF FURNACE BRAZING

produces a high quality product...at low cost...from a minimum of material



● The material required, for instance, when brazing a disc on the end of a tube may be 75% to 80% less than if the hollow flanged part is cut from the solid. This means substantial machine and labor savings. Finishing costs of brazed pieces are low too, because the assemblies are discharged from the furnace smooth and free from scale.

The fillets along the joint, and the high shear strength of the alloy in the joint, (usually greater than the parent metal) prolong the life of assemblies that are subjected to vibration and impact. Brazing avoids localized overheating, distortion, and the cost of straightening. Consequently the process is ideally used for joining hollow articles such as floats, pulleys, etc.; and is readily adaptable to any size and shape, and weight and quantity requirement.

To get maximum results, let EF engineers, with their wide experience, work with you on your next brazing job. Fully descriptive folders including many suggested "do's" and "don't's" sent promptly on request.

EF

THE ELECTRIC FURNACE CO.

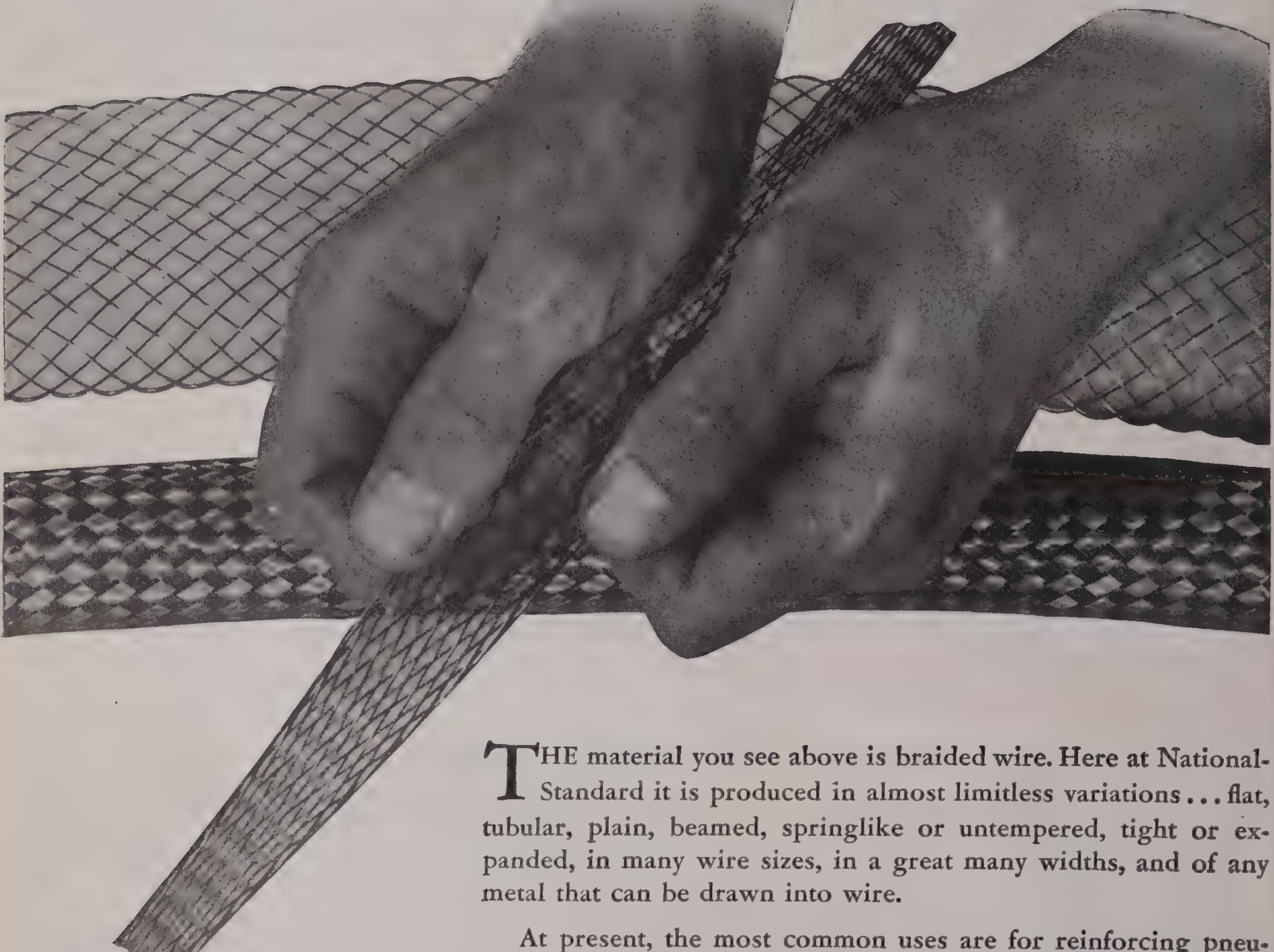
WILSON ST. AT PENNA. R.R.

Salem-Ohio

GAS FIRED, OIL FIRED AND ELECTRIC FURNACES
FOR ANY PROCESS, PRODUCT OR PRODUCTION

Tough...flexible...decorative...

maybe it can give you ideas!



THE material you see above is braided wire. Here at National-Standard it is produced in almost limitless variations ... flat, tubular, plain, beamed, springlike or untempered, tight or expanded, in many wire sizes, in a great many widths, and of any metal that can be drawn into wire.

At present, the most common uses are for reinforcing pneumatic tire beads, high pressure hose and other rubber products. In these applications its strength and mechanical adhesion qualities are unsurpassed.

Considering its limitless variations and unique qualities, braided wire is bound to have many other effective applications. Perhaps it can save or make money for you! An interesting possibility, for example, is its use with transparent plastics to produce pleasing patterns as well as reinforcement.

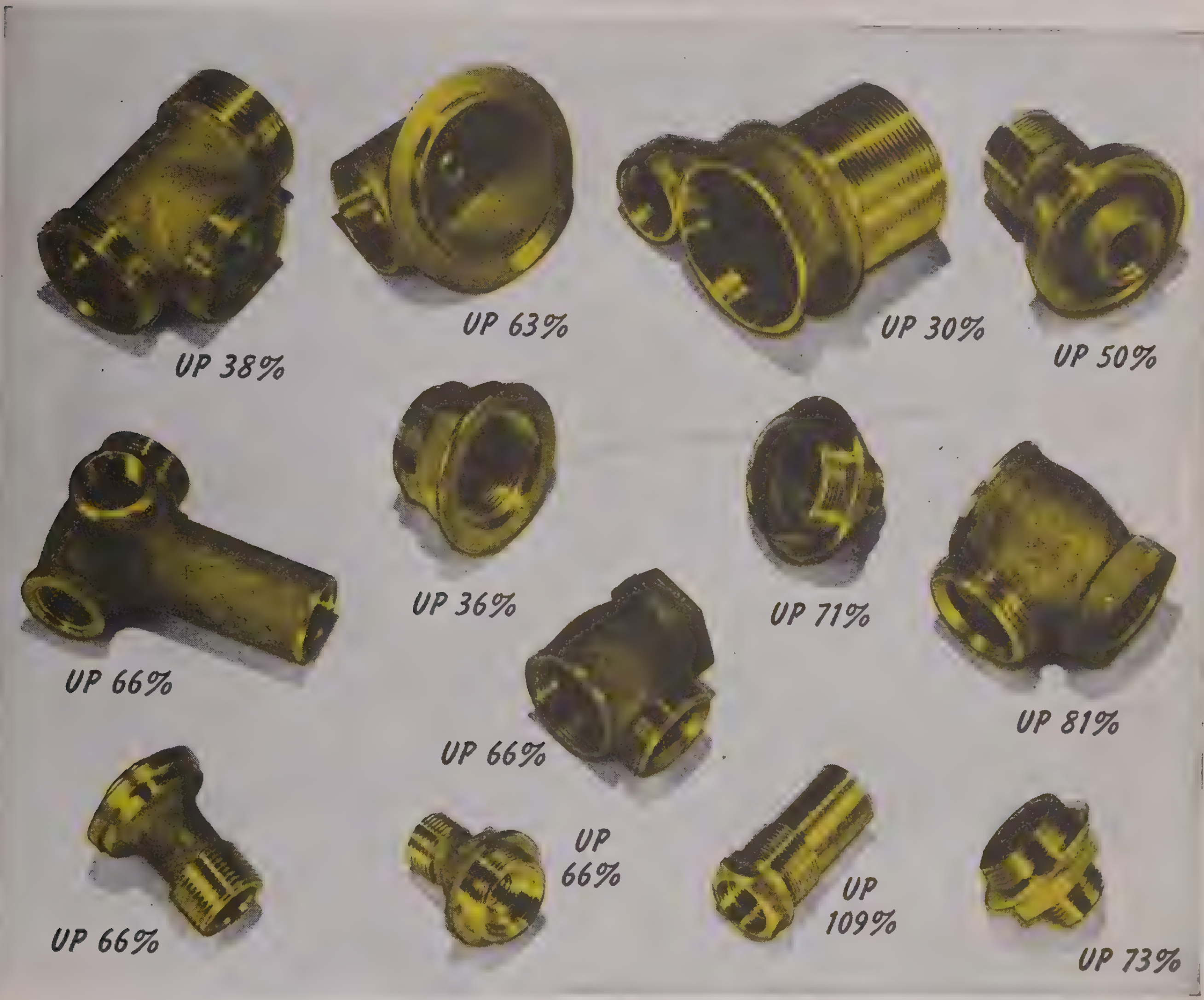
If all this gives you an idea you'd like to explore, be assured that National-Standard, as usual, is ready to cooperate with you all the way. Let's talk it over. Just get in touch with the *National-Standard Company, Niles, Michigan.*

NS
NATIONAL-STANDARD
Company
NILES, MICHIGAN

DIVISIONS OF NATIONAL-STANDARD CO.

ATHENIA STEEL	*Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD	*Niles, Mich.*	Tire Wire, Fabricated Braids and Tape
WAGNER LITHO MACHINERY	*Jersey City, N. J.*	Lithographing and Special Machinery
WORCESTER WIRE WORKS	*Worcester, Mass.*	Round Steel Wire, Small Sizes

Do you make brass parts like these?



Electro-Cycle TRADE MARK makes them *52% faster*

● When an efficient plant in the highly competitive brass industry can increase production of the parts shown above by 52%, *that's news!*

Six new Warner & Swasey Electro-Cycle Turret Lathes, replacing six cone head machines, did just that. These new Electro-Cycles, with their instantaneous automatic spindle action, are making records just as remarkable in many other brass shops across the country. Hadn't you better find out what they can do for you?

WARNER & SWASEY
Cleveland

You Can Machine it Better, Faster, for Less.. with a Warner & Swasey

TURRET LATHES, MULTIPLE & SINGLE SPINDLE AUTOMATICS, PRECISION TAPPING AND THREADING MACHINES

For Top Precision
Greater Convenience
Longer Wear

Specify

TAFT-PEIRCE GAGE BLOCKS

SET NO. 82-A	SET NO. 35-A
The Complete Set Plus	*Precision with Economy*

STYLE NO. 9500TC

Tungsten Carbide Wear Blocks— Life Insurance for your Master Standards

These new and different gage block sets offer you time-saving convenience with extra value and the guaranty of precision which the Taft-Peirce name assures.

Set No. 82-A includes, in addition to the usual 81 standard sizes, an extra block of .10005″ which you will find extremely useful for checking in half-tenth combinations where tolerances are close.

Set No. 35-A includes the 35 blocks needed to make the most commonly used combinations — a smaller set but the same unvarying standard of accuracy.

Two sizes of Tungsten Carbide Wear Blocks are now available, measuring .050″ and .100″ respectively. They can be wrung to either or both sides of a combination, to bear the wear and tear of working contact, adding life to your gage block set, far beyond their cost.

All sets are boxed for ready visibility and quick accessibility in the exclusive Taft-Peirce Ready-Selector case. Each block has its size clearly marked right where you want it on the upright edge — always readable at a glance. The working surface of all blocks is identical — $1\frac{3}{8}''$ x $\frac{23}{64}''$. Blocks tilt into selector position as illustrated, with finger-tip pressure.

These are examples of the added convenience and utility you get when you buy your Master Standards of Production from Taft-Peirce!

GAGE BLOCKS		WEAR BLOCKS	
Set No. 82-A	$385.00	Set of 2	$40.00
Set No. 35-A	200.00	Singly	20.00

All Sets packed in Mahogany Case

The Taft-Peirce Manufacturing Co.
WOONSOCKET 1, RHODE ISLAND

TIMKEN® GRAPHITIC TOOL STEELS MACHINE FASTER AND BETTER

ONE OF FIVE BIG REASONS WHY TIMKEN GRAPHITIC TOOL STEELS MAKE BETTER TOOLS, DIES, AND GAGES

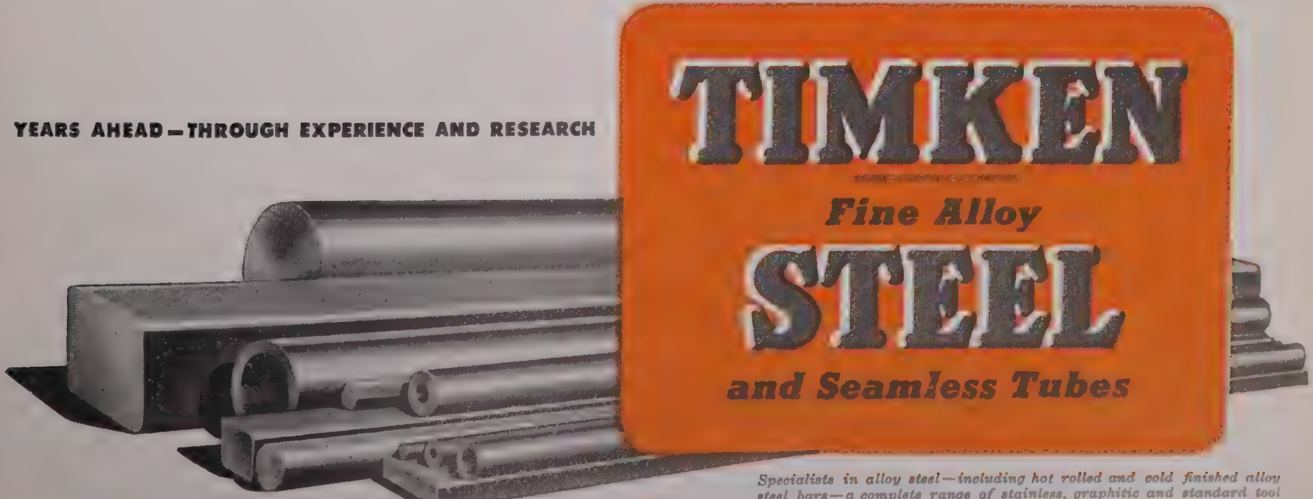
BECAUSE Timken graphitic tool steels contain particles of free graphite, they machine faster than other tool steels. Many manufacturers have cut machining time and have gotten better surface finish by switching to Timken graphitic steels!

Besides speeding production, Timken graphitic tool steels help improve product quality. The presence of free graphite and diamond-hard carbides in the structure gives Timken graphitic tool steels a unique ability to retain lubricants and stubborn resistance to wear and abrasion. They also have excellent non-seizing qualities . . . good stability . . . less tendency to scuff and score . . . uniform response to heat treatment.

These features are basic to all Timken graphitic tool steels—Graph-Mo, Graph-Tung, Graph-Al, Graph-Sil, Graph-M.N.S. And each of these analyses has special advantages for particular applications.

Get full details on the many benefits of Timken graphitic steels for tools, dies and gages from your Timken Company representative. And for a free copy of our 48-page, illustrated booklet "Timken Graphitic Tool Steels", which contains valuable information on heat treating and uses, write Steel and Tube Division, The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

Courtesy New York Central System

JML co F-EE1b

UN-LIMITED!

Federated Metals Division
AMERICAN SMELTING AND REFINING COMPANY
BABBITT

There are unlimited applications for bearing metals, and an alloy from Federated's complete line to cover virtually every one successfully and economically.

In railroading, under the most severe conditions of load and speed, bearings of Federated babbitt provide complete security.

From its complete line, Federated can provide the *right* babbitt for *your* job —"XXXX Nickel" and "Thermodyne" tin-base babbitts for rugged service; "Merit" metal and "Record" lead-base babbits for lighter loads; "G" and "S" babbitts for precision bearings or special properties.

Federated's 11 plants and 25 sales offices make it easy for you to get babbitt or other non-ferrous metals. For help with your bearing problems, call or write the nearest Federated office.

Federated first in the non ferrous field FMD

Federated METALS

Division of American Smelting and Refining Company, 120 Broadway, New York 5, N. Y.

YESTERDAY...
TODAY...
TOMORROW...

BAUSH

SPEEDS PRODUCTION

Whether it be drilling, boring, reaming or tapping—Baush Machine Tools meet every need in the evergrowing battle of economical production.

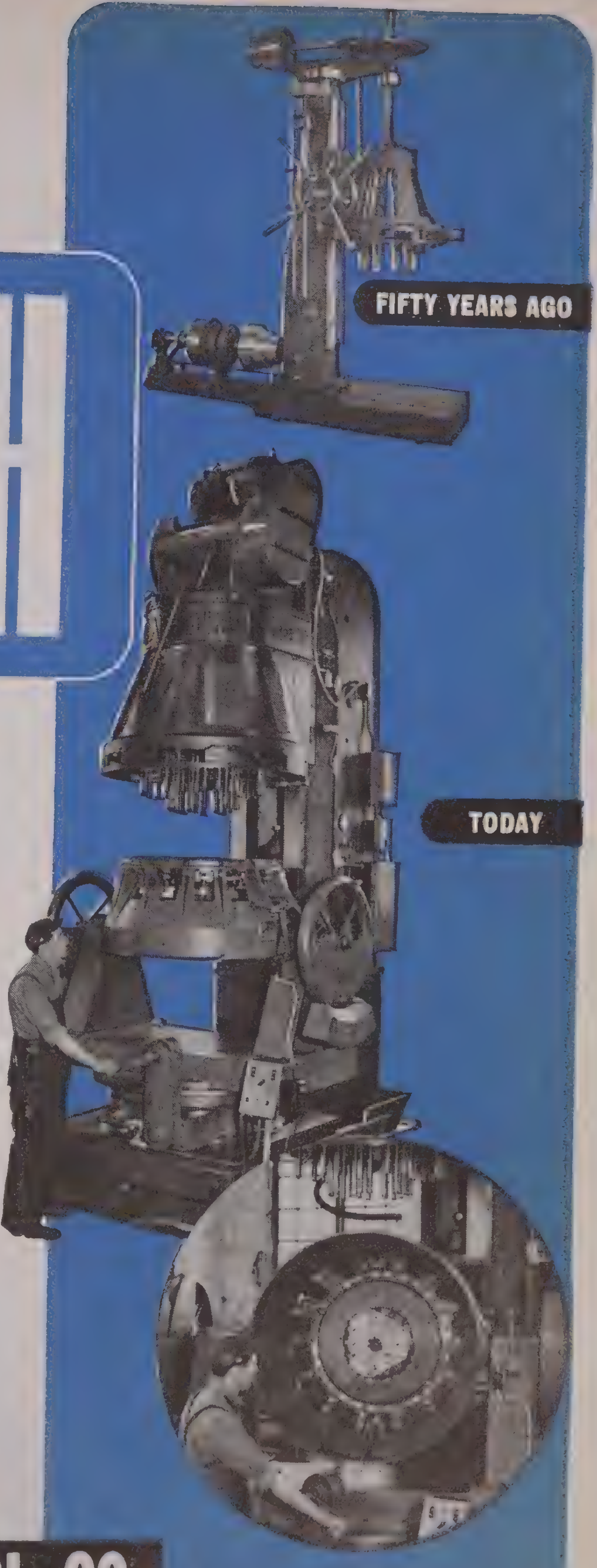
Every manufacturer wants profits. Modern machines designed for specific jobs to give precision, speed, economy and ease of operation are the answer.

The Multiple Spindle Drill illustrated is just one of many special units designed and built by Baush. It is working proof that 50 years of experience can, and will, show you production line profits.

Our engineers will gladly help you solve your problems. Write us—call us—wire us—we're ready to help.

Drilling 70 holes on 3 various bolt circles with Baush W-7 Hydraulic Multiple Spindle Drill. 36″ diameter round head is furnished with 35 slip sleeve spindles with nose adjustment, master-bored cluster plate and Texrope drive. 50″ ballbearing index table, with geared hand crank indexing, has trunnion type fixture which rotates 180° for first 35 hole drilling—table is then rotated 1/7 turn and final 35 holes drilled.

BAUSH MACHINE TOOL CO.
SPRINGFIELD 7, MASSACHUSETTS



[illegible] and radially from one hole.

SPOTLIGHTING ★★★

a new and complete line of

MORSE-FORMSPRAG

FULL COMPLEMENT OVER-RUNNING CLUTCHES

- ★ **Instant Engagement**
- ★ **Instant Disengagement**
- ★ **Accurate Indexing**
- ★ **Positive Action**

A new principle in clutches . . .

BORROWING an idea from the wooden sprag that oldtimers used to prevent wagons from rolling backward, yet allowing free forward motion — Morse-Formsprag Clutches have come forth with the ultimate in Over-Running Clutch design.

Each Morse-Formsprag Clutch contains a full complement of sprags between inner member and housing. Contact between sprags is maintained by a circular pressure spring which acts as an energizing medium.

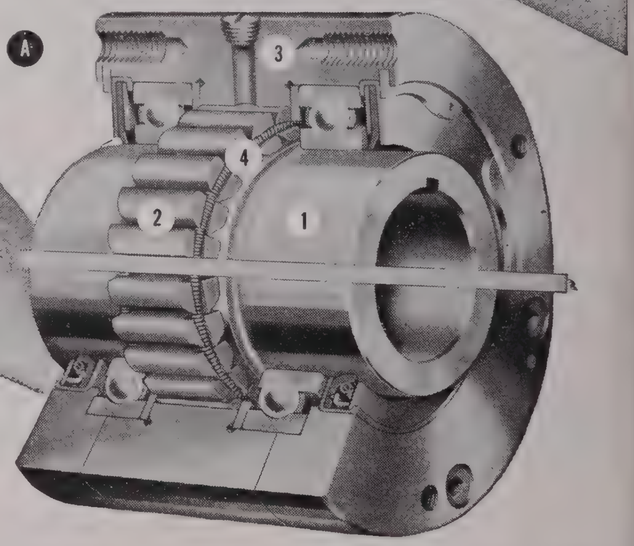
Because of the full complement of sprags used in Morse-Formsprag Clutches, localized stress is minimized. This design simplicity permits the greatest possible torque capacity for size and weight.

Three types of Morse-Formsprag Over-Running Clutches are available from stock—for indexing, over-running or backstopping:

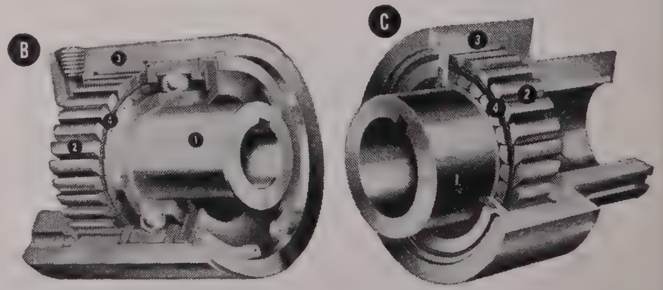
A. All-Purpose Ball-Bearing Type.
B. Indexing and Backstopping Ball-Bearing Type.
C. Plain-Bearing Type.

These three types are carried in stock with a variety of finished stock bores ready for immediate use. Special sizes and designs can be furnished to fit your requirements.

For detailed information, installation suggestions and ordering data, write Dept. 182 for Morse-Formsprag Catalog C11-42. Address: Morse Chain Company, 7601 Central Avenue, Detroit 8, Michigan.



1. Inner Member 2. Sprag 3. Housing 4. Energizing Spring



1. Inner Member 2. Sprag 3. Housing 4. Energizing Spring

Roller Chain Drives

Morflex Couplings

Morse Silent Chain Drives

MORSE

MECHANICAL
POWER TRANSMISSION
PRODUCTS

A PRODUCT OF
B-W
BORG-WARNER

Morse-Rockford Over-Center Clutches

MORSE CHAIN COMPANY • DETROIT 8, MICHIGAN

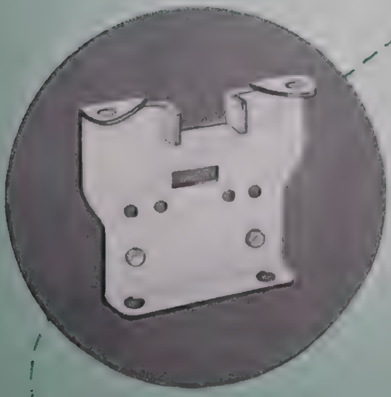
Weirzin

ELECTROLYTIC ZINC-COATED SHEETS AND STRIP

Reduces Die Cost

BY LENGTHENING DIE LIFE

Weirzin has a tight electrolytic zinc coating that lubricates dies without danger of leaving a zinc deposit. Die maintenance expense is thereby sharply reduced, and the life of the die increased.



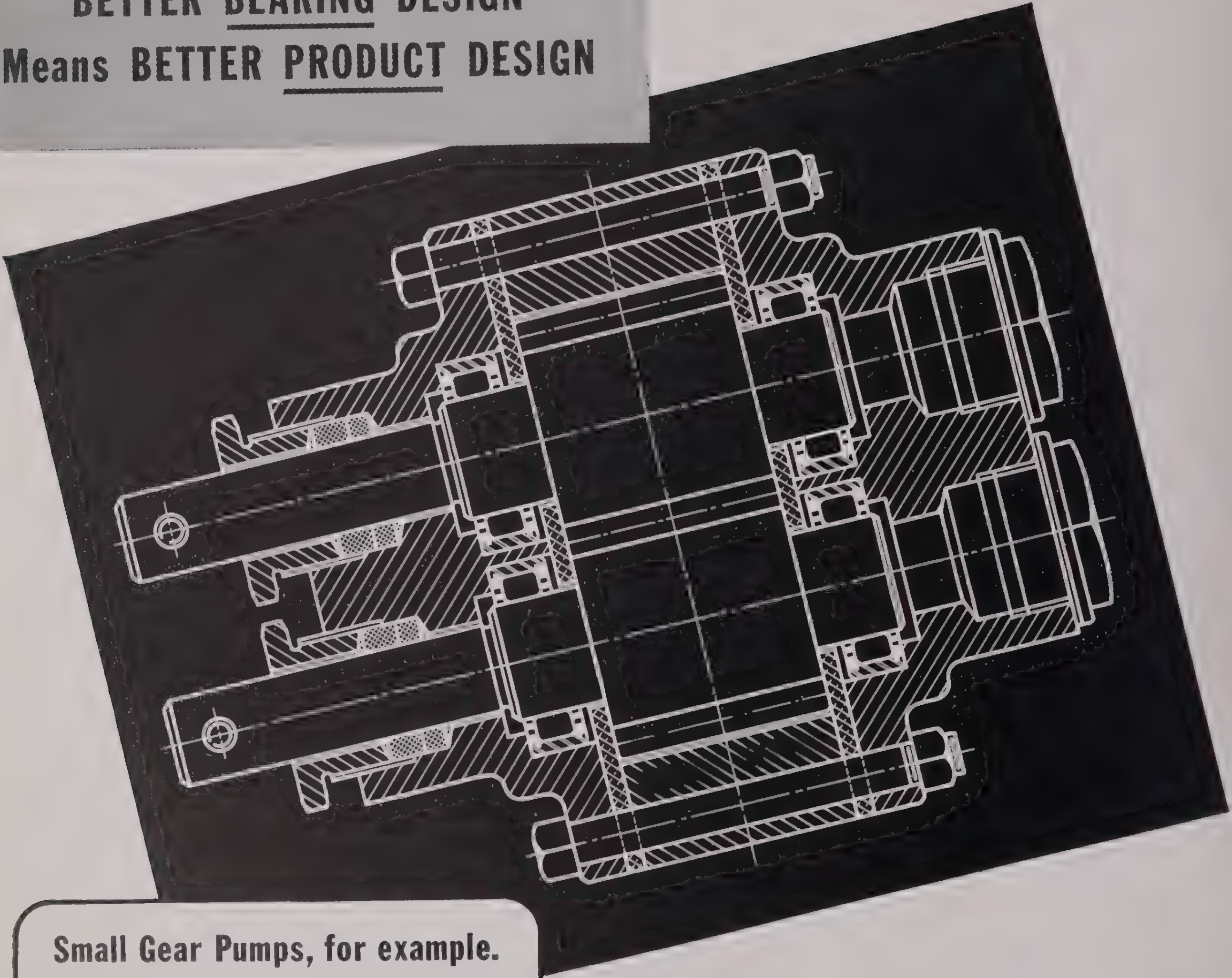
A specific example of this, reported by a fabricator, relates that instead of the usual production run of 100,000 pieces from dies when using ordinary carbon steel, change to Weirzin increased production to over 400,000 pieces. This 300% average increase in production per set of dies is too great a factor in present-day costs to be ignored. You might find such an opportunity in your own plant.

The most severe fabricating operations will not cause Weirzin to peel, flake or powder. Its electrolytic zinc coating remains intact under deep drawing or difficult forming and bending operations without deterioration. For more specific information, write

WEIRTON STEEL CO.

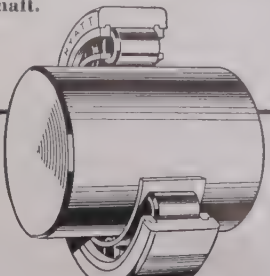
WEIRTON, W. VA. • *Sales Offices in Principal Cities*
Division of **NATIONAL STEEL CORPORATION** • *Executive Offices, Pittsburgh, Pa.*

BETTER BEARING DESIGN
Means BETTER PRODUCT DESIGN



Small Gear Pumps, for example.

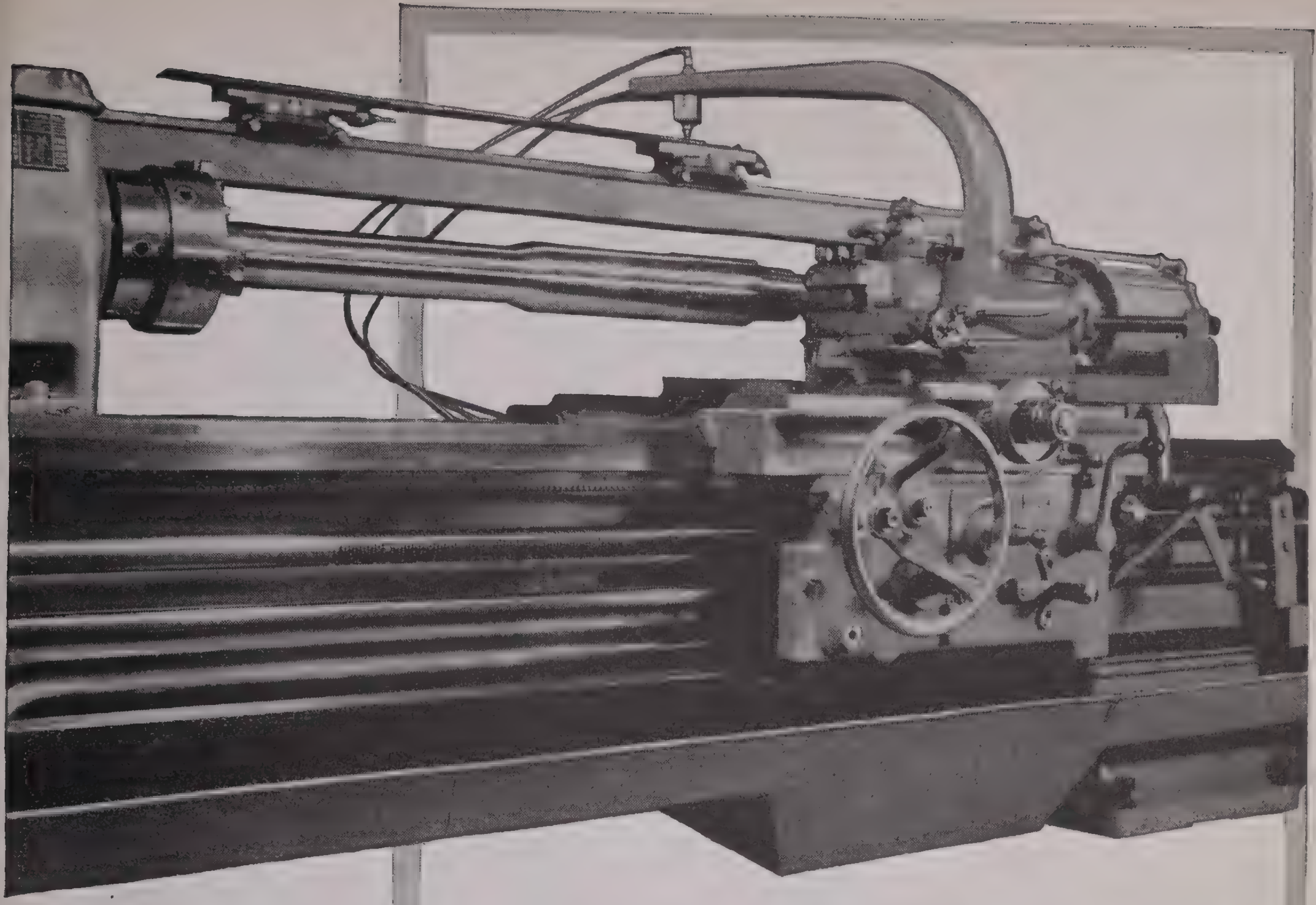
Shorter distance between the shaft centerlines, without sacrificing shaft diameter—free floating shafts, permitting pressure balancing—and ease of assembly—are features which add to the overall compactness and efficiency of this design. Hyatt Hy-Load Roller Bearings made it possible because they have greater radial load capacity than any other bearing of the same standard size and type. And Hyatt design permits omission of the bearing inner race—thereby, either reducing the required bearing O.D. space, and/or permitting the use of larger shaft.



Better design and better performance—not only in gear pumps, large and small, but in virtually every type of industrial equipment—is a "matter of record" where Hyatt Roller Bearings are used. That's because fitting the bearing to the job—not the job to the bearing—is the Hyatt way of engineering.

Thus, when Hyatt Roller Bearings are built into a machine, you have the assurance that the bearing is planned, manufactured and applied for your specific requirements. Hyatt Engineering Service is at your disposal without cost or obligation. Address Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS



30% MORE PRODUCTION ...14 LESS TOOLS

with Monarch Air-Gage Tracing

Single-point stepless Air-Gage Tracing from a thin master template is saving 1½ hours production time per shaft on this job.

When turned on a conventional "automatic lathe" with fifteen cutting tools, only 14 shafts were machined in 8 hours. By the new Monarch method, rough turning takes a mere 11.45 minutes; finish turning, 11.08 minutes—and with a tolerance of .002″. The former method required leaving .050″ to .060″ of grind stock; only .012″ to .015″ must be removed after machining on the Monarch. Furthermore, by the old method the pressure of 15 cutting tools belled out the work centers so badly that recentering was necessary before grinding—another operation saved by single-tool Air-Gage Tracing, the Monarch way.

Summarizing; savings are made in machining time, in grinding, in auxiliary operations and handling—and in set-up time, tool sharpening and tool investment. Even more important, the Monarch Air-Gage Tracer Lathe stands instantly available to make similar savings on *all production jobs* in the shop—changeover involves the mere substitution of the master template.

Does that kind of time-saving, money-saving "peak production at a profit" appeal to you? We'll be glad to furnish complete information on how Air-Gage Tracer-equipped Monarch Lathes can meet *your* metal turning requirements.

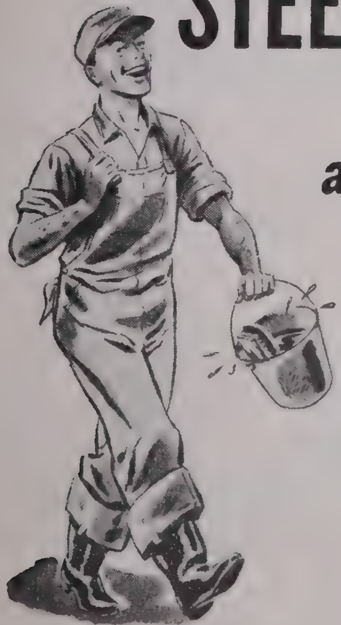
THE MONARCH MACHINE TOOL CO.
SIDNEY, OHIO

ACCURACY · ECONOMY · LONG LIFE
Monarch
TURNING MACHINES

FOR A GOOD TURN *FASTER*—TURN TO MONARCH

Crown Cork and Seal Company, Baltimore, Md., uses austenitic chromium-nickel stainless steel to assure the sanitation, durability and trouble-free performance of their CEMAC 28 unit. Easily cleaned, this stainless steel is highly resistant to foodstuffs, atmosphere, most organic and a great many inorganic chemicals, and to dyes and sterilizing solutions. ➡

Use of STAINLESS STEEL.... *minimizes "CLEAN-up" time*



and CUTS MAINTENANCE COSTS, *too!*

You can save money—and time too—because of the ease with which this equipment can be cleaned.

The rotary vacuum filler-capper, shown above, is equipment of this kind. It saves money, time and labor, *day-after-day.*

Easy to clean and keep clean, it also combats wear and general abuse because it's made of chromium-nickel austenitic stainless steel.

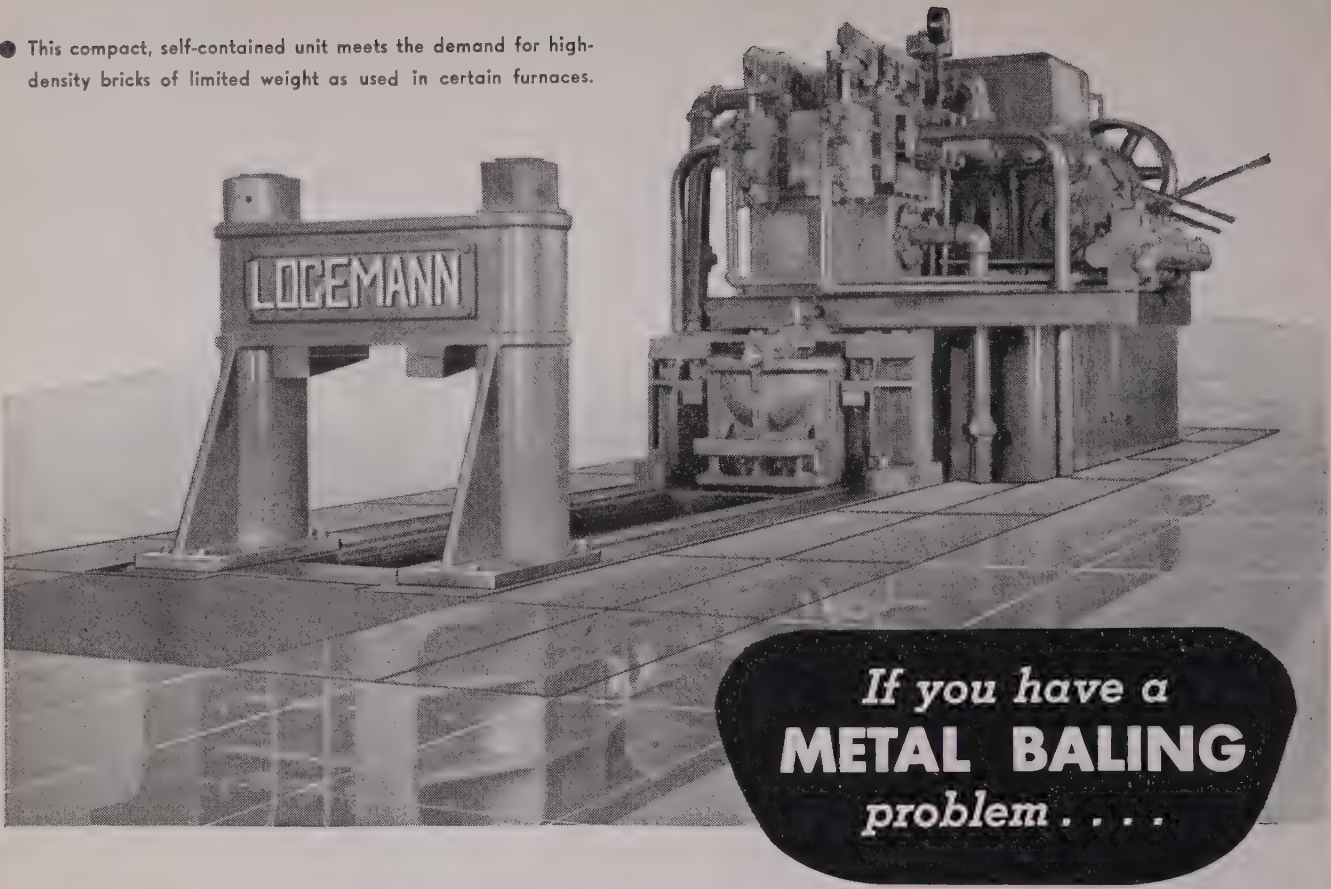
Corrosion-resistance combined with high strength make chromium-nickel stainless steel an ideal material for equipment. Considerably stronger than plain carbon steel, it permits cutting bulk and deadweight without sacrificing strength or durability. In addition it may be readily formed, and is easy to weld.

Leading steel companies produce stainless steel containing nickel in tubular, sheet and strip form. A list of the sources of supply will be furnished on request.

EMBLEM OF INCO SERVICE
TRADE MARK

Over the years, International Nickel has accumulated a fund of useful information on the properties, treatment, fabrication and performance of engineering alloy steels, stainless steels, cast irons, brasses and bronzes and other alloys containing nickel. This information is yours for the asking. Write for "List A" of available publications.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 WALL STREET
NEW YORK 5, N. Y.



● This compact, self-contained unit meets the demand for high-density bricks of limited weight as used in certain furnaces.

Let LOGEMANN *give you the answer!*

For nearly 75 years, Logemann Brothers Co., have been building Scrap Presses to meet specific conditions.

WHAT is your particular metal baling problem . . . limited floor space . . . more tonnage . . . bricks of a specified weight . . . dissimilar scrap . . . costs? Why not turn your problems over to Logemann? Pioneers in the metal baling field, we have the long years of experience and engineering background that can be of definite help in solving your own particular problem. We have been doing it for almost 75 years! A standard range of sizes in two and three-ram styles (with or without automatic controls) are currently being produced and new features are incorporated to meet present unprecedented needs. You can have a scrap metal press with all of Logemann's time-tested features . . . one that is specifically designed to meet your requirements. Write today for further information. Tell us the nature of your scrap and the tonnage desired . . . we'll do the rest!

LOGEMANN'S Engineering Service

. . . is available to you. Let us help you arrive at the efficient and economical way of handling your scrap regardless of the unusual problems you may present to us. No obligation.

LOGEMANN BROTHERS CO.

3164 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

solid copper facing with a tough
steel core
—the economy+service idea in flexible tubing

SuVeneer

T. M. REG. U. S. PAT. OFF.

COPPER CLAD METAL

Simple—isn't it? Take an easy-handling coil of SuVeneer Copper Clad . . . twist and crimp it just so . . . and you have fine flexible tubing that is *strong* as its tough steel core, *resistant to corrosion* as its solid copper facing inside and out!

This is but an instance of SuVeneer Clad Metal's almost endless versatility . . . may we help you in developing your own profitable applications? Write.

Specialists

roduction of fine strip steels since 1892

- Su Veneer Clad Metal
- Stainless in all grades
- Alloys and Spring Steels

Superior Steel

CORPORATION

CARNEGIE, PENNSYLVANIA

Wherever steel is made...

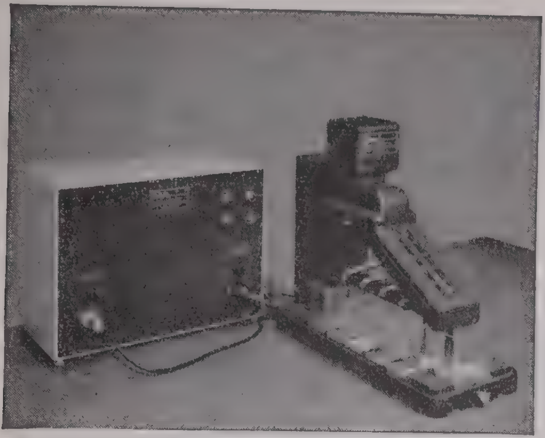
DEPENDABILITY PHILO BRAND QUALITY · SERVICE

DEPENDABILITY RAINIER BRAND QUALITY · SERVICE

Pacific Coast mills and foundries will benefit greatly by the steel industry's billion-dollar expansion program.

Ohio Ferro-Alloys Corporation
Canton, Ohio
Chicago Detroit Pittsburgh San Francisco Tacoma

1. Speed 2. Accuracy 3. Flexibility



MERZ Model A *New-Tronic* Ball Sorting Machine.
Precision-sorts 3,600 balls an hour.

Merz NEW-TRONIC Gaging Equipment

Gives All Three!

Merz *New-Tronic* equipment offers exceptional speed and accuracy—as well as cost-cutting flexibility—on a wide range of gaging and sorting operations. Manufactured and sold exclusively by Merz, under famous electronic patents acquired from Jack & Heintz, *New-Tronic* equipment is available in three types:

MERZ NEW-TRONIC BALL SORTING MACHINES: Two standard models. Model A handles balls from 3/32″ to 7/32″, in graduations of 1/32″. Model B handles sizes from 3/16″ to 1/2″, in graduations of 1/16″. Both make ten selections automatically, to an accuracy of ten, twenty or 50 millionths. Special shims are available for other increments. Speed of both models is 3,600 balls an hour.

MERZ NEW-TRONIC HEIGHT GAGE: Furnished complete with stand, which is equipped with *fine-adjustment* for speed and convenience in operation. Gaging head mounting is provided with a standard A.G.D. lug, making unit readily adaptable for use with existing fixtures.

MERZ NEW-TRONIC COMPARATORS: For external measurements. Four models, with fixed or adjustable work-contact pressure. Each model is equipped with two magnification scales.

It will pay you to get complete information on these high-speed precision units, as well as on other types of Merz equipment. Write for full details.

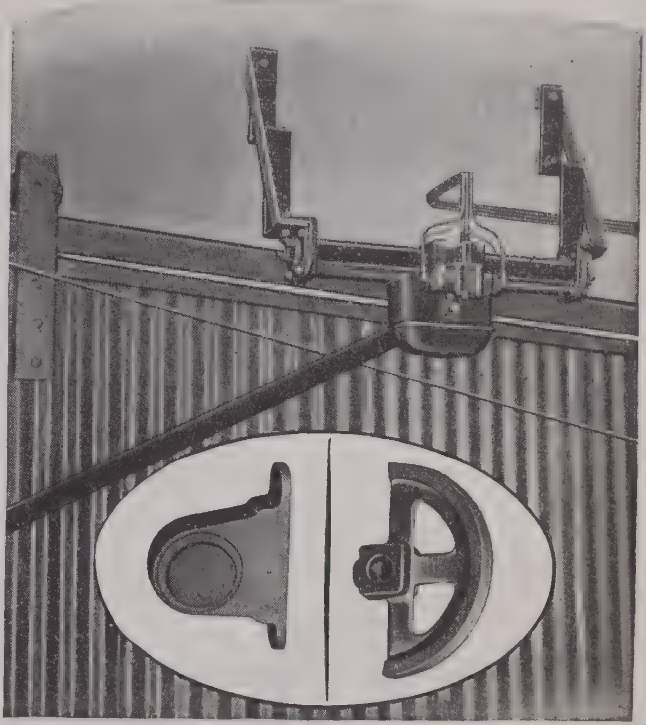
MERZ ENGINEERING COMPANY • INDIANAPOLIS 7, INDIANA

MERZ

New-Tronic Gaging and Sorting Equipment—New-Matic Measuring Machines—A.G.D. Standard and Special Gages—Tools and Special Machinery—Experimental Projects.

Pneumatic Door Operating Equipment

MUST STAND UP



The National Pneumatic Company originated and developed door operating and control equipment that is recognized as standard throughout the entire transit industry. Their doors are installed also in many factories, public buildings, arsenals, etc.

Our forgings have been chosen for the valve blocks and segment gears. The dies for these important parts—as for all National forgings—are so designed that the fibre-like flow line structure is concentrated at points of greatest shock and stress.

Forgings are being used for more and more products because they provide unparalleled toughness, tremendous fatigue resistance, and maximum strength.

Write today for booklets and send us inquiries for custom drop forgings.

National forgings carry the trade mark "N"—your guarantee of Fine Quality Forgings.

THE NATIONAL LOCK WASHER CO.
DROP FORGING DIVISION
NEWARK 5 NEW JERSEY

PUSH TO **START**

PULL TO **STOP**

NEW MODEL 110
DOUBLE SPINDLE HEAVY DUTY
BUFFER and POLISHER

One of the greatest innovations to add efficiency and ease of operation.

Combination switch and brake automatically stops the wheel spindle when switch is in "stop" position.

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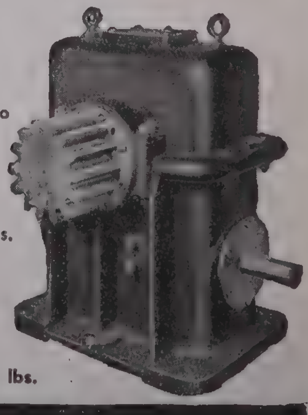

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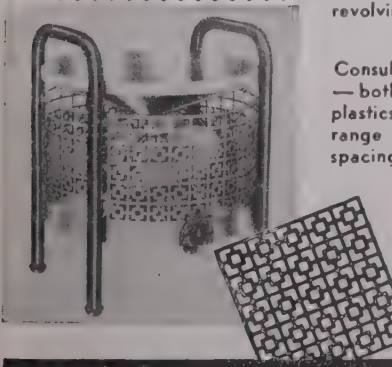

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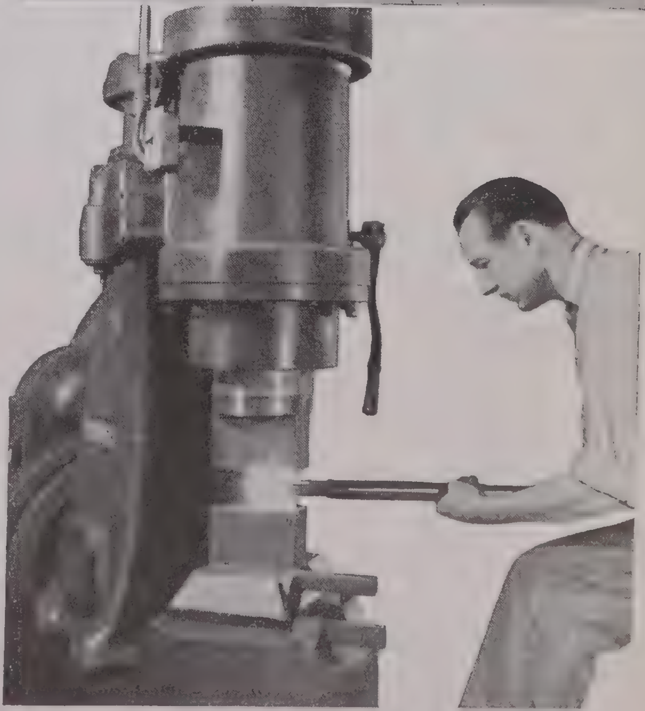

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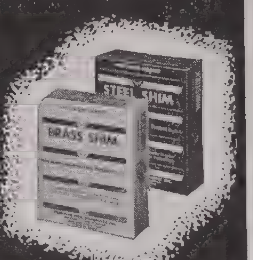

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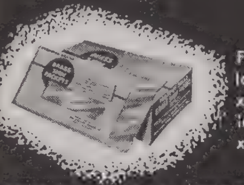

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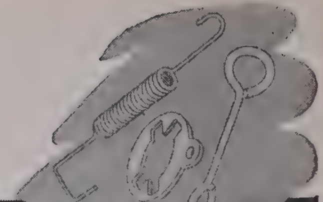

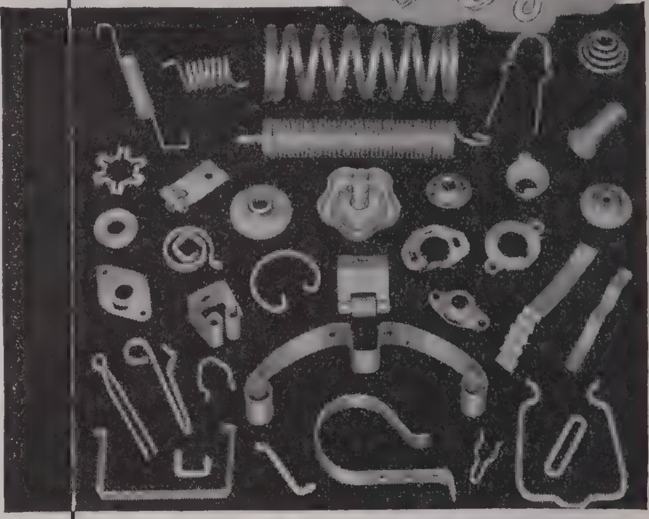

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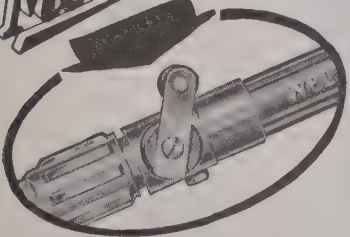

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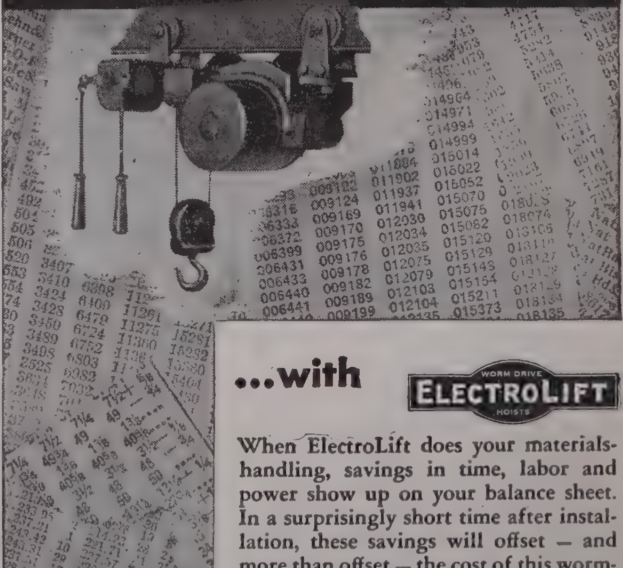

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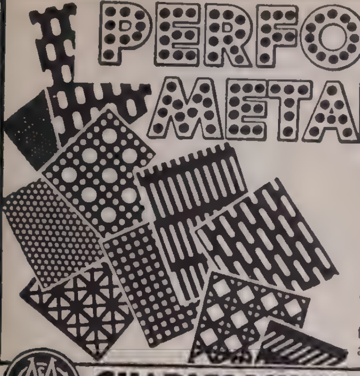

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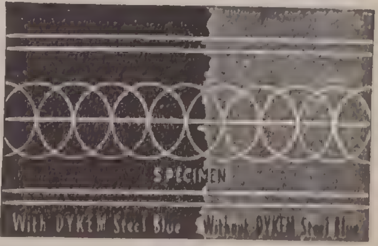

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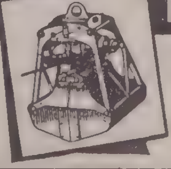

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#180 Niagara Rotary Combination Machine, Motor Driven, Burring, beading, crimping, circle cutting, flanging 12, 14 and 16 gauge

CORRUGATING MACHINES
12′ Robinson Sheet Roll Corrugating Machine 29″ Dia. Roll. Dies for 1¼″, 2½″ Corr.
12′ Stamco Toggle Press, Capacity #14 Gauge

CRANE—CRAWLER
Model 1426 SPEEDCRANE, Full Revolving, Mounted on Crawler Treads, Gasoline Operated, 65′ Sectional Boom. Capacity 6500# at 45′ radius to 35,200# at 13′ radius

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P & H	37′6″ Span 440/3/60 AC
5 ton Northern	60′ Span 220/440 AC
5 ton Niles	68′ Span 230 Volt DC
7½ ton P & H	38′5″ Span 230 Volt DC
10 ton Shaw Box	38′5″ Span 440/3/60 AC
5 ton Louden	45′ Span 220/440 AC
10 ton P&H	38′ 8″ Span 220/440 AC
10 ton P&H	50′ Span 220/440 AC
10 ton P & H	58′3″ Span 220/440 AC
10 ton Morgan	52′ Span 230 Volt DC
25 ton P & H With 5 ton Auxiliary	50′6″ Span 220 Volt DC

CUT-OFF MACHINE
Billings & Spencer Di-Matic Cut-Off Machine Horizontal Type—2 Spindle, Designed to cut-off, form and drill, capacity 1½″

DIEING MACHINES
25 ton Henry & Wright Dieing Machine Double Roll Feed, Scrap Cutter 2″ Stroke
60 ton Henry & Wright Dieing Machine, Double Roll Feed, Scrap Cutter, 5″ Stroke
75 ton Henry & Wright Dieing Machine Double Roll Feed, 6″ Stroke, Motor Driven

DRAW BENCHES
50,000# Aetna Standard Double Chain Draw Bench 30′ Draw. Both Complete with Elecl. Equipment
200 ton Southwark Hydraulic Draw Bench, Working Pressure 1500 lbs.

FLANGING MACHINE
Blue Valley Flanging Machine, Motor Driven, Capacity 10 ga. to 5/16″ thick, 4′ to 12′ Diameter

FORGING MACHINES
1″, 2½″, 3″, 3½″, 5″, Ajax
1½″ Acme, 1¼″ Pawtucket

FURNACES
2 Ton Heroult Nose Tilt Type Melting Furnace
3 Ton Heroult Rocker Tilt Type Melting Furnace
Lee Wilson Rotary Hearth Heat Treating Furnace Oil Fired for forging, forming, heat treating etc. Rotary 11′ Dia.
500# Electric Furnace Co. Tilting Type Rotary Gas Furnace. Complete with Accessories

GEAR HOBBING MACHINES
120-H Gould & Eberhardt Universal, Motor Drive. Change gears to cut diversified range of spur, single & double helical gears
No. 5B Sykes eGar Generator, Motor Driven. Will cut a gear from 3″ to 61″ dia. by 48″ wide on spur and 21″ on Herringbone. New 1945
Fellows Straight Line Gear Generator Floor Model Motor Driven. For Gears Pinions and racks from 30 to 200 D.P.

GEAR REDUCERS
600 H.P. Westinghouse Reduction Unit Ratio 3.76-1 With 600 H.P. Westinghouse A.C. Motor
500 H.P. Mesta Double Reduction Ratio 11:1
800 H.P. Falk Single Herringbone Gear Reducer, 366/40 RPM
1000 H.P. Falk Double Reduction Ratio 29:1
1200 H.P. Falk Double Reduction Ratio 29:1

GRINDERS
10″x36″ Cincinnati Hydraulic Cylindrical Grinder. Complete with Elecl. Equip.

HAMMERS—BOARD DROP
1000# Billings & Spencer Model D
2000# Chambersburg Model F
2500# Erie
4000# Erie
4000# Chambersburg Model F

HAMMERS—STEAM DROP
700# Chambersburg, Air Operated
1000# Chambersburg
1250# Chambersburg
2000# Chambersburg
2500# Chambersburg Model E
4000# Erie—NEW 1942
5000# Erie—NEW 1942

HAMMERS—STEAM FORGING
200, 400, 500, 600, 750,
1000, 1250# Chambersburg
1000, 1100, 1250, 1500#, Niles-Bement-Pond
2500# Single Frame Niles-Bement-Pond
3000# Chambersburg Double Frame
6000# Chambersburg, Double Frame

HAMMER—MISCELLANEOUS
1000# Chambersburg Pneumatic Motor Driven Forging Hammer, Complete with Motor
48″ x 48″ Chambersburg CecoStamp Hammer
48″x36″ Chambersburg CecoStamp Hammer
30″x24″ Chambersburg CecoStamp Hammer
48″x66″ Chambersburg CecoStamp Hammer

HEADER
#33 Waterbury Farrel D.S.O.D. Header Capacity 7/16″ Diameter, 6″ Long

INGOT ROTATOR
50 ton Forge Ingot Rotator

JIG BORER
Model 1836 Cleereman Jig Borer, Complete with accessories & elecl. equipment, New 1946

LATHE — ROLL
44″ Hyde Park Fdry & Mche Co. Roll Lathe, 58″ Actual Swing x 17′16″ Bed, M. D.

LEVELLER—ROLLER
36″ McKay 17 Roll Leveler, Rolls 5¼″ Dia.

MANIPULATOR
15 ton Alliance Straight Line Manipulator

PLANERS
84″x84″x20′ Pond Planer 4 Hd. P.R.T.
96″x96″x20′ Niles Planer, 4 Hd. Motor Driven

PLANER—OPEN SIDE
48″ x 48″ x 12′ Liberty Openside Planer, Two Rail Heads. One Side Head
36″ x 36″ x 8′ Detrick & Harvey Open Side Planer, Solid Table Type, Belt Driven

PRESS—GAP FRAME
No. 77 Toledo Open Back Gap Press 100 Ton Capacity, 12″ Stroke, 18″ x 30″ Bed Area

PRESSES—HYDRAULIC
75 Ton HPM Fastraverse Hydraulic Press, 90″ Maximum Travel, 20″ x 30″ Bed Area. Used on 24″ Stroke
300 ton HPM Hydraulic Press. Complete with Pump & Motor. Bed Area 30″ x 36″, Stroke 18″, Daylight 24″
700 Ton Robertson Hydraulic Extrusion Press, Complete with Pump & Motor
750 ton Lake Erie Double Acting Hydraulic Press, Platen 146″ x 81½″, Stroke 46″
1000 ton Chambersburg 4-Column Hydraulic Press, 18″ Stroke, 48″ x 22″ Between Columns
1000 Ton United Steam Hydraulic Forging Press
1500 ton Wood Hydraulic Press, Complete with Pump & 75 H.P. Motor, 12″ stroke, 48″ x 48″ Bed Area

PRESSES—INCLINABLE
#8R Rockford Inclinable Geared Press, 100 ton, 4″ Stroke, 27″ x 45″ Top of Bolster
#5 1/2S Rockford Inclinable Geared Press, 56 ton, 4″ Stroke, 18″ x 32″ Top of Bolster

PRESS—KNUCKLE JOINT
No. K-1200-30 Clearing Knuckle Joint Press 200 Ton Capacity 4″ Stroke, 31″ Between Uprights
No. 663 Toledo 400 ton Knuckle Joint Press

PRESSES—STRAIGHT SIDE
#8-60 Bliss Press Double Geared, Twin Gear Drive· 12″ Stroke, Bed Area 42″ x 61″
#16 Waterbury-Farrel 255 Ton, 6″ Stroke, 35″ Between Uprights
No. 76½ Bliss Press 215 Ton, 4″ Stroke, 27″ Between Uprights
#168¼ Toledo 350 Ton, 8″ Stroke, 40″ Between Uprights
800 Ton Ferracute Press 32″ Stroke, 9′4½″ Between Uprights
#83 Bliss Straight Side Reducing Presses (7) Strokes 8″ to 13″ (NEW)
#78½ Bliss Single Crank Press, 400 Ton, 10″ Stroke, 36″ Between Uprights
#D201 Ferracute Single Crank Press, 6″ Stroke, 32″ Between Uprights
#1½ Bliss Cam Drawing Press, 7″ Stroke of plunger, 3½″ Stroke of blankholder, 19″ Between Uprights

PRESSES—TRIMMING
#8 Erie Trimming Press, 8¾″ Stroke 22″ x 20″ Bed Area, 3″ Stroke of Side Shear
3 Billings & Spencer Trimming Press, distance between uprights 18″ x 22½″

PUNCH—HORIZONTAL
No. 1 Hilles & Jones Horizontal Punch, Capacity ⅞″ thru ¾″

PUNCH & SHEAR COMBINATIONS
No. 2 Hilles & Jones Double End Punch & Shear, 36″ Throat, Capacity Punch 1″ thru ¾″
Style BA Cleveland Double End Punch & Shear, 12″ Throat, Capacity ½″ thru ½″
Style G Cleveland & Punch & Shear Single End 60″ Throat, Capacity Punch 2″ thru 1″ plate
Style EF Cleveland single end arranged for geared Motor Drive, 72″ Throat Capacity Punch 1¼″ thru 1″

ROLLING MILLS
8 x 4½″ McWilliams Single Stand Two High
16½ x 30 Mesta Single Stand Two High
20½″ x 30 Mesta Four Stand Two High
20 x 60″ Three Stand Two High
9″ Two High Hot Mill for rolling strip steel
30″ Hot Strip Mill

ROLLS — FORMING
Model W-212 Yoder Roll Forming Machine, M.D. Will handle strip 12″ wide & smaller, Complete with Cut-Off motor driven

ROLLS—PLATE STRAIGHTENING
98″ Hilles & Jones Plate Straightening Roll 6 Rolls 11″ Dia. Capacity 1″ Plate

ROLLS—TAPER FORGING
#1 Ajax Taper Forging Roll, Motor Drive
#5 Ajax Taper Forging Roll, Motor Drive

SAWS
Z-36 Do-All Zephyr Saw, Motor Driven—36″ Throat, 36″ Work Table—New 1947
42″ Newton Type U-82-A Heavy Duty High Speed Cold Saw, Completely Hydraulic, Elecl. Equipment Included. Capacity 16″ Round or Square with 48″ Blade
AVEY Band Saw, Motor Driven Capacity 6″ Round or Square
52″ Ryerson Friction Saw, Motor Driven Power Feed, Comp. with Elecl. Equipt.

SCALE
Fairbanks, Morse Warehouse Printomatic Dial Scale, Capacity 25,000 x 5# less tare (NEW 1947)

SHEARS — ALLIGATOR
No. 1½ Doelger & Kirsten Alligator Shear Motor Driven. Capacity 2″ Round
No. 2 Doelger & Kirsten Alligator Shear Motor Driven. Capacity 3″ Round

SHEARS—ANGLE
No. 7 Cleveland Angle Shear, Motor Driven, Capacity 8 x 8 x 1⅛″ Angles. Independent Clutch Operation
6 x 6 x ½″ Hilles & Jones Double Angle Shear, Motor Driven

SHEARS—BAR
United Engrg. Co. Bar Shear, Motor Driven, Capacity. 2½″ Square
No. 1 Long & Allstatter Bar Shear, Motor Driven, Capacity 2″ Round, 1¾″ Square

SHEAR—BILLET
No. 6 Mesta Billet Shear, Motor Driven, Capacity 6″ x 6″ Square Billets

SHEARS—GATE
9′ x ¾″ Bertsch Gate Shear, Arr M.D.
120″ Morgan Gate Shear, Motor Driven. Hydraulic Holddowns. Complete with pump and motor. Capacity 1½″ Mild Steel

SHEARS—ROTARY
No. 250 Kling Rotary Shear, Arr. Motor Drive, 36″ Throat Capacity ¼″ Plate
No. 500 Kling Rotary Shear, Motor Driven. Capacity ½″. Complete with circle cutting, flanging and joggling attachments

STRAIGHTENERS
⅜″ Shuster Straightening & Cut-Off Machine, Motor Drive. With 16′ Cut-off
No. 4 Medart Straightening Machine Arranged for Motor Drive. Capacity 2½″ to 6″ Incl. Round Bars
No. 4 Sutton Straightening Machine, Motor Drive Capacity 2″ to 6″ Round, Timken equipped
26 Roll Shape Straightener, Arr. Motor Drive Rolls 8½″ Dia. x 2¼″ Wide. Straightens 1″ and 2″ Hexagons & Squares
Kane & Roach Rotary Straightener, Capacity ½″ O.D. and smaller

SWAGING MACHINE
#412 Etna Machine Co. Rotary Swager, Arr. M.D.—Capacity Tubing 4″, Die Length 18″—New 1945

TESTING MACHINES
20,000# Baldwin Southwark Model S-10-C Universal Hydraulic Testing Machine
60,000# Riehle Universal Hydraulic
200,000# Riehle Universal
200,000# Elmes Compression Testing Machine, Hydraulic Type
400,000# Riehle Universal, Motor Driven
800,000# Hydraulic Chain Testing Machine

TUMBLING BARRELS
48″ x 72″ W W Sly Tumbling Barrel, M.D. New 1942
30″ x 54″ W W Sly Tumbling—NEW
30″ x 48″ W W Sly Tumbling Barrel

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LATEST TYPE NEARLY NEW MACHINES

AUTOMATIC SCREW MACHINES
BILLINGS & SPENCER #B2 Di-matic Cut Off, Latest Type
BROWN & SHARPE #4, 1½″ capacity, latest type
GOSS & DeLEEUW 8″ Automatic Chucker, 5 spindles, Latest
NATIONAL ACME 9/16, 5 spindle, Model D, M.D.

BORING MILLS—Horizontal
CINCINNATI-GILBERT 3½″ Bar Floor Type, Latest
DETRICK & HARVEY 4″ bar, Floor Type, M.D.
FISHER 5″ bar, Floor Type, Latest
GIDDINGS & LEWIS #25, 2½″ bar, M.D.
GIDDINGS & LEWIS #32, 3½″ bar, M.D.
HEALD #48A Single End 2-spindle, Latest
HEALD #49 Universal Single End, Latest
LANDIS #35, 3½″ bar; Floor Type
LUCAS 41, 3″ bar, Latest Type
NILES BEMENT POND 4½″ bar, M.D.
NILES BEMENT POND 5″, 6″, bar, floor type
P & H #10 3½″, bar floor type, M.D.
UNIVERSAL 3″ bar, high speed, latest type
UNIVERSAL No. 3A, 3″ bar M.D.

BORING MILLS—Vertical
BETTS 120″, 2 swivel heads, AC, M.D.
BULLARD 16″ 6-spindle Type D Mult-Au-Matics
BULLARD 16″ 8 spdle., Type D, Mult-Au-Matic
KING 36″ Vertical Turret, M.D., Latest Type
KING 62″ 2 swivel heads, PRT, Motor Drive
NILES 72″ Heavy Duty, 2 swivel heads, PRT, M.D.
NILES 84″ Heavy Duty, 2 swivel heads, PRT, M.D.
NILES 100″ Heavy Duty, 2 swivel heads, PRT, M.D.

BROACHES
CINCINNATI 1-30 Duplex, Vertical, Surface, Double Ram, Model ER, Hyd., Latest
CINCINNATI 3-30 Duplex, Vertical, Surface, Double Ram, Model ER, Hyd., Latest
LaPOINTE #3 mech., Motor Drive
LaPOINTE SRV-10-54. Vert. Surf. Hyd., Latest

DRILLS—Multi. Spindle
BAUSH 4 Adj. multiple spdl., M.D.
BODINE #42-20, #42-30, Latest Type
FOOTE BURT 20 spindle, latest type
KINGSBURY 4 spindle Model GC, latest type
NATCO #D5 Adj. multiple spdl., latest type
PRATT & WHITNEY #12 Adj. multiple spdl., M.D.

DRILLS—Radial
AMERICAN 5′13″ Triple Geared M.D.
AMERICAN 5′ Triple Purpose, Motor Drive
CINCINNATI BICKFORD 6′15″ plain or univ., M.D.
DRESES 5′13″ universal, Motor Drive
DRESES 4′13″ Plain Motor Drive
FOSDICK 5′14″ Motor Drive
NILES 6′ Universal, Motor Drive
WESTERN 5′18″, 6′20″, latest type

DRILLS—Sensitive
ALLEN #2 3-spindle #2MT Motor Drive
ALLEN Type HMDB SS Bench, Latest
AVEY Type MA6 3-spindle #2MT, Latest
BARNES #H3 Hydram, heavy duty, hydraulic, latest
BUFFALO #14 3-spindle, Latest
COLBURN #14 2 spindle M.D.
DELTA Single spindle bench latest type
EDLUND #1B, #2B, #2MS, 1 to 3 spindles, latest type
FOOTE BURT #2, #3, single spindle, latest type
HENRY & WRIGHT 2 spindle, M.D.
HIGH SPEED HAMMER Model R53, latest type
LELAND & GIFFORD #2MS, SS HYD, Latest
LELAND & GIFFORD #2 2-spindle Swivel heads MD
SNYDER #10V-18 Vertical Hydraulic, Latest

GEAR CUTTING EQUIPMENT
BARBER COLMAN Type S hobber, latest type
BARBER COLEMAN #3 Hobber, "Standard," Latest
BARBER COLMAN #12 hobber, Motor Drive
BROWN & SHARPE No. 3H gear cutter, M.D.
FELLOWS #615A, #61, #645A3, #7A, #72, 61A, #77 High Speed Gear Shapers; latest type
FELLOWS #12M Involute Measuring Instrs, Latest
FELLOWS #6Z2 Gear Shaper; high speed; latest type
FELLOWS #13LS Lapper, latest type
GLEASON 3″ Straight Bevel Generator, Latest Type
GLEASON 12″, straight bevel generator, Latest Type
GLEASON #7 hypoid, spiral, bevel, zerol, Latest Type
GLEASON 10″, 15″, Spiral Bevel Generator, M.D.
GLEASON 11″, 18″ Straight Bevel Generator, M.D.
GLEASON #17 Auto. Hypoid Grinder, Latest Type
GLEASON #20 Spur Gear Tester, latest type
GLEASON #4, #6, #13, #18 Bevel and Hypoid Tester
GOULD & EBERHARDT 12HS hobber, Latest Type
GOULD & EBERHARDT 96H Hobber with DIFFERENTIAL, Motor Drive
PFAUTER #1, #2 universal hobber, M.D.
PRATT & WHITNEY 10″ Grinder, hyd., latest

GRINDERS—Cyl.—Plain & Univ.
BROWN & SHARPE #1, 2, 3, 4, Universal, Latest
BROWN & SHARPE #5 Plain, 3 x 12, Latest Type
BROWN & SHARPE #20 10x18 plain, latest type
CINCINNATI 6″ x 18″ Plain, Model EA, Hyd., latest
LANDIS 10x24 Universal Type C, Hydraulic, Latest
NORTON 10x18 Type C, plain, Motor Drive.
NORTON 16x72 Plain Type "C", latest type

GRINDERS—Miscellaneous
BARBER COLMAN #3 Hob Sharpener; latest type
BLACK & DECKER 10″ Double End Bench, Latest
BRYANT #5, #16-16, #16-CP-16, #24, Internal Hydraulic, latest type
CINCINNATI Centerless Lapping Machine, Latest Type
CINCINNATI #2 Centerless; latest type
CINCINNATI #2 Plain Cutter & Tool; latest type
CINCINNATI #3 Centerless, M.D.
DELTA 7″ Double End Bench, Latest
EXCELLO 46C Double End Carbide, Latest
FITCHBURG 14″x25″ Spline, hydraulic latest
GLEASON #12 tool sharpener Latest Type
GALLMEYER & LIVINGSTON Style A7T, Drill
HEALD #191 Tool Sharpener, Latest
HEALD 50, 70 Internal M.D.
HEALD 75A, 72A3, 81 Internal; latest type
JONES & LAMSON 6x15, 8x48, Thread Grinder, latest
LANDIS 5″ oscillating, external, M.D.
OLIVER #510 Drill Grinder, latest type
PRATT & WHITNEY Contour Cutter, Latest
SELLERS 4T Tool, Latest Type
THOMPSON 6″x48″ Auto., round broach, M.D.

GRINDERS—Surface
ARTER 8″ Auto. Piston Ring, M.D.
BLANCHARD #16, 24″ chuck, M.D.
BLANCHARD No. 16A—Dial Type—M.D.
BLANCHARD #11, 16″; Latest Type
G. & L. #55, 12x36 hyd., latest type
HEALD #22 Rotary, 12″ chuck, latest type
HEALD 25A Rotary, 30″ chuck, Latest
KENT 6x18, Latest Type
MATTISON 14x16x60 hydraulic, latest type
MATTISON 14x24x72 Hydraulic, Latest Type
NORTON 6x18 Hydraulic; latest type
PRATT & WHITNEY 8″ Rotary, M.D.
THOMPSON 16x30x48 hydraulic, latest type

JIG BORERS
PRATT & WHITNEY #1A Motor Drive
PRATT & WHITNEY #3B Model 4854, Latest Type
REED PRENTICE #5 Die Sinker, Latest
VERNON Precision M.D., Latest

LATHES—Engine and Mfg.
AMERICAN 18 x 72″ centers, Geared, M.D.
AMERICAN 36 x 360″ centers, 2 Car., Geared, M.D.
BARNES #420, 2 spdl. deep hole drill, Latest Type
BAUSH 1½″x30″ 2 spdl. deep hole drill and borer
BRIDGEFORD 36″x32′ bed—2 carriages M.D.
ELGIN #CB-59 precision bench, Latest Type
FAY & SCOTT 28/60x12′ centers Sliding bed gap M.D.
HARDINGE TR-59, Latest Type
HENDEY 12x54″ centers, M.D.
JONES & LAMSON "Fay" 20x25″ automatic, latest
KEIGHLEY LIFTS 8/16x26″ centers gap, Latest
LeBLOND 17″x8′ Bed Belted, Motor Drive
LeBLOND 19″ x 30″ centers, Regal, Timken, Latest
LeBLOND 20″x8′ Bed Belted, Motor Drive
LIPE 16″x30″ centers Carbomatic, Latest
LeBLOND #2 deep hole borer, Latest Type
LeBLOND 17x5′, 20″x10′ bed, RP, Timken, Latest
LeBLOND 25 x 96″ centers, Geared, Motor Drive
LEHMANN 16x30″ centers, TIMKEN, latest type
LODGE & SHIPLEY 18x72 centers, M.D.
LODGE & SHIPLEY 36″x144″ centers; geared; M.D.
LoSWING 4x60, 4x84, 8x60, 8x108, 5x34, Latest
MONARCH 12x30″ centers; Timken; latest type
MONARCH 12″ x 54″ centers, Model C, Timken, Latest
MONARCH 16x28″ geared-head, M.D.
MONARCH 10″20″ centers, Model EE, Timken, latest
MOREY Model A 8″x120″ shaft turner, Latest Type
NILES 42″x60″ double head, motor drive
NILES 60x10′, centers, PRT., Latest Type
NILES 72″x62′ centers, comb. Boring Turning
NILES 30x50′ Boring, Timken, Latest Type
NILES 48x87′ centers, comb. boring and turning, M.D.
NILES 90″x110″ Centers Car Wheel, M.D.
PRATT & WHITNEY ½Bx30″, 2 spindle, latest
PRATT & WHITNEY 10″x20″ centers Bench, latest
REED PRENTICE 16x24″ centers, geared head, M.D.
SCHAUER Type NA1EC Speed, Latest
SEBASTIAN 16″ 36″ centers, Timken, Latest Type
SPRINGFIELD 14″x6′ bed, geared head, M.D.
SPRINGFIELD 16″x6′ bed, geared head, M.D.
SPRINGFIELD 16″x30″ centers Timken, latest type
SUNDSTRAND 8″x15″ centers Style D. Auto. Stub,
WARD, HAGGAS & SMITH—18/30x66″ centers gap, motor drive, Latest Type

LATHES—Turret
BARDONS & OLIVER #5, #7, TIMKEN, Latest Type
CINCINNATI ACME No. 1 Timken, Latest
GISHOLT #1L, #2L, Universal, Timken, Latest
GISHOLT #3, #4 Univ. Bar, Latest Type
GISHOLT #5 Univ. Chucking, Latest Type
JONES & LAMSON #3 Univ. Bar and Chuck, Latest
JONES & LAMSON #5 Univ. Bar and Chuck, Latest
JONES & LAMSON #8A Univ. Bar and Chuck, Latest
LIBBY No. 1H-5 Timken Bearing—latest—5½″ hole
MOREY No. 2G, No. 3, No. 4, Timken Bearing, latest
POTTER & JOHNSTON 5D2E, Auto., Timken, latest
WARNER & SWASEY 5, Universal, Timken Bearing
WARNER & SWASEY 1A Univ. Chucking, Latest
WARNER & SWASEY #2A Univ. Bar and Chucking, Latest Type
WARNER & SWASEY #1A, #3A Univ. M.D.

MILLING MACHINES—Mfg.
CINCINNATI 24″, 48″ duplex, TIMKEN, M.D.
HALL Style D, Planetary, latest type
INGERSOLL 42″x38″x12′ adj. rail, 4 heads, A.C., M.D.
INGERSOLL 32x24x16′ Planer Type, 2 heads, AC, M.D.
INGERSOLL 32x30x12′ adj. rail slab, M.D.
SUNDSTRAND Model 3A Duplex, latest type
TAYLOR & FENN M80 Duplex Spline, latest

MILLING MACHINES—Plain
BRIGGS Type A, Latest Type
BROWN & SHARPE #3B Timken, Latest
CINCINNATI 0-8 Automatic rise and fall, latest
CINCINNATI #4 TIMKEN, Motor Drive
CINCINNATI #3, 4, 5, Motor Drive
CINCINNATI 24″ automatic, TIMKEN, M.D.
CINCINNATI 4-36 hydromatic, Latest Type
KEARNEY & TRECKER 1218, TIMKEN, latest
KEARNEY & TRECKER #3, 4, Heavy, Timken, M.D.
KEMPSMITH #4 Maximiller, Timken, latest type
LEBLOND #4 heavy duty, M.D.
SUNDSTRAND #2 Electro-mill, Latest Type
SUNDSTRAND #3 Rigidmil Timken M.D.

MILLING MACHINES—Thread
HANSON & WHITNEY 4″x9″, Latest Type
MOREY 12x30, 120, 190, Latest Type

MILLING MACHINES—Universal
AMES Bench, M.D., latest type
BROWN & SHARPE #3A, M.D.
CINCINNATI #3 Universal, Dial Type, Timken, latest
HARDINGE Model UM, Timken, latest
KEARNEY & TRECKER #3B, Motor Drive
KEARNEY & TRECKER #3H, Timken, latest
KEMPSMITH #4 Maxi-Miller Timken, Latest Type

MILLING MACHINES—Vertical
CINCINNATI #2, #3, #4 Dial Type; Timken; latest
CINCINNATI #08, TIMKEN, Latest Type
CINCINNATI #3, #4 High-Powered, M.D.
COCHRANE BLY #14 univ., M.D.
GORTON 9J with or without Duplicator, Latest Type
KEARNEY & TRECKER #2H Timken, Latest
KEARNEY & TRECKER 2K Timken, Latest
MOREY 12M 2-spindle Profiler, Latest
REED PRENTICE #5 die sinker, latest type
REED PRENTICE 3VG, with or without Hyd. Duplicator, Timken Bearing, Latest Type
SUNDSTRAND #3A, rotary, Latest Type
SUNDSTRAND #3 Profile and Channel, Latest

PLANERS
BETTS 96″x 96″ x 20′-4 heads, PRT, Box Table, M.D.
CHANDLER 36x36x20′, 4 heads, AC, M.D.
CINCINNATI 120″x 96″ x26′—4 heads, BoxTable, M.D.
CLEVELAND 48″ x 60″ x 20′ Openside; 3 heads; A.C., M.D.
DETRICK & HARVEY 48x48x16′, 4 heads, Hyd.
GRAY 22″x22″x4′, 1 head, A.C., M.D.
GRAY 36″x36″x8′—2 heads, Max. service, D. C. variable. Speed Motor Drive.
LIBERTY 24x24x8′ Vari-Voltage, Latest Type
NILES 48x48x12′ 4 Heads Box Table DC MD
NILES 54″ x 54″ x 18′ 4 heads, Box Table, M.D.
NILES 72″ x 72″ x 25′ 4 heads, Box Table M.D.
NILES BEMENT POND 48x48x16′, 2 heads, AC, M.D.

PRESSES
BIRDSBORO 325 ton, vert. hyd., Latest Type
CHAMBERSBURG 50 ton, vert. hydro-pneumatic
CHAMBERSBURG 200 ton, horiz. straightening, M.D.
CLEARING Type DS-1125-32 dbl. action 125 ton, Latest Type.
FERRACUTE #DG-55, 75 ton drawing, Latest Type
GLEASON 15 ton Quenching, M.D.
GREENERD #2, #6, #12 Arbor, Latest
HANNIFIN 15 ton moulding, Latest Type
NIAGARA #3 inclinable, M.D.
LUCAS 30-Ton Forcing, Latest
TAYLOR & FENN #11A spring, Latest Type
TOLEDO #2 inclinable, M.D.
WATSON & Stillman 20 ton hyd. straightening, latest

SHAPERS and SLOTTERS
CINCINNATI 32″ Universal, Latest Type
CINCINNATI 24″ Crank, M.D.
DILL 20″ Vertical, Motor Drive
GOULD & EBERHARDT 16″ High Speed, Motor Drive
GOULD & EBERHARDT 32″ Invincible, M.D.
LAMAIRE 18′ Vert. Hydraulic—latest type
LYND FARQUHAR 26″ openside, M.D.
NEWTON 15″ vert. slotter, DC, M.D.
NILES 18″ vert. slotter, DC, M.D.
ORMEROD 8″ Vertical, latest type
PRATT & WHITNEY 6″, 10″ Vertical, M.D.

MISCELLANEOUS
BARNES #172, 306H, 307 Vertical Hone, Latest
BAKEWELL #1, 1R Tapper, Motor Drive
BILLINGS & SPENCER 1500 lb. Board Drop Hammer
CAMPBELL 401 Abrasive cut-off Saw, Latest
CINCINNATI Centerless Lapping Machine, Latest Type
CLEVELAND 12″x16′ centers—Cutter Reliever, M.D.
DETROIT #DH-1, PH-1 BRINELL tester, Latest
GROB #OS20 Saw and Filer, Latest
LANDIS 1½″ Bolt Threader, Latest Type
MORTON 60″ combination traveling hd., planer, miller and borer, M.D.
NAZEL, #4B Pneumatic Hammer, M.D.
NIAGARA #03, ⅛x36″ shear
NORTON #2F Vertical Lapper—Latest Type
PEERLESS 14x14 Hack Saw, Latest Type.
PITTSBURGH Type A-2 Brinell tester, Latest Type
PORTER CABLE Type AG-8 Sander, Latest Type
PRATT & WHITNEY (KELLER) Type BL-2416 Copying, latest type, 2 & 3 Dimensional
PRATT & WHITNEY (KELLER) Type G Copying; latest type 2 Dimensional
RIEHLE 1500 lb tester, Latest Type
ROCKWELL Model #3QR tester, Latest Type
TINIUS OLSEN Model 3A tester, Latest Type
TANNEWITZ GH-36 Band Saw, latest type
VAPOR BLAST Model B-20 Liquid hone
WYSON & MILES #283-B borer, Latest Type
WHITON 8″x108″ duplex centering, Latest Type

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VERT. & HOR. BORING MILLS

3″ bar Univ. Table Type, S.P.D.
3½″ bar Cinci. Gilbert, table type, 84″ spin. to outer support, 42″ spin. to table, 1943.
3½″ bar Landis #35, Floor Type
4″ bar Foot-Burte, hvy., floor type, 1942
4″ bar Universal Table Type, 96″ spin. to outer support, 60″ spin. to tbl., 1943
4″ bar Landis #40, Floor Type
5″ bar Sellers, Table Type, 120″ spin. to outer support, 42″ spin. to table, 1943.
5″ bar Fisher, Floor Type, 1942
6″ bar Ingersoll Floor Type, hvy., 1945
12′ Betts, 2 hds., M.D.
30″ Colburn, 1 turret head, M.D.
36″ Bullard Spiral Dr., 3 jaw, 1942
36″ Bullard, Spiral Dr., 4-jaw, 1943
42″ King, P.R.T., M.D.
48″ N.B.P. Car Wheel
53″ N.B.P. 2 hds., P.R.T.
62″ King, one rail and one side hd., late
72″ Cinci. Rapid Production, M.D.

LATHES

No. 4 B LeBlond Boring, Capty. 28′ & 20′6″ (2), 1942
14″ x 30″ cc Reed-Prentice Tool Room
14″ x 54″ cc Sidney Tritrol Tool Room
No. 16. LeBlond Auto. Production, 1942
16″ x 36″ P. & W. Tool Room, Mtr.-in-base,
20″ x 54″ P. & W. Tool Room, Mtr.-in-base,
18/36″ x 8′ Fay Scott, Gap, Q. C. G., M.D.
18″ x 120″ centers Amer. T.A., Cone, M.D.
18″ x 86″ centers Hendey, T.A., M.D.
20″ x 240″ LeBlond, 1941
25″ x 18′ Bed LeBlond, M.D.
28/48″ Harrington, sliding bed gap.
30″ x 12′ Bed LeBlond, T.A., M.D.
32″ x 12′ centers H.S.G., T.A.
36″ x 32′ Bed N.B.P., 2 carr., T.A.
50″ x 17′ centers LeBlond, 1942
50″ x 19′ centers N.B.P., taper, AC, 1942
72″-84″ x 25′ centers Washington, 1943

TURRETS & AUTOMATICS

3L Gisholt, 1942
Nos. 5 & 3 W. & S. Univ., late
No. 1 B. S. Screw Mach., new 1945 (3)

RADIAL DRILLS

2B-8 Edlund 8″, 1 Spin. (2), 1942
3 Spin. Leland-Gifford, #1 LMS, 1943
5′ Amer. Tri. Purp., 11″ col.
7′ Carlton 17″ col., 2′ extra high, 1943
42″ Baush Radial Tapper, ½″ capty., 1941

MILLING MACHINES

Burr Keyway, 72″ table
No. 2 Cinci. Rech. Arm Horiz. Pl.
#2MH Cinci. Univ., 1944
No. 2 Van Norman Duplex
#3K Kearney & Trecker Vert., 1943
4″ Rice Barton Spline, 1942 (2)
12″ x 102″ Lees-Bradner Thread Miller
1848 K. & T. Simplex, 1944
24″ x 24″ x 16′ Ingersoll Planer Type, 4 swivel hds., 20 h.p., AC, M.D.
#1—8 Kent Owens, Hyd.
#2 B & S Univ. Cone
#2A B.&S. Univ., 1942
#4 Kempsmith Maxi-Mil, Vertical

GRINDERS

60″ P. & W. Vert. Surface, 1942
52″ Besly #372, vert., spin., disc, AC dr., '45
#42 Heald Borematic, Late
#47A Heald Borematic, Late
24″ x 240″ Norton Cyl., M.D.
17″ x 28″-40″ Norton Crankpin Dbl. Hd.
14″ x 72″ Norton, Older type
#13 B. & S. Univ. Late
10″ x 24″ Landis Univ., Hyd., 1942
No. 72A5 Heald Plain Internal, 1943 (8)
No. 72A3 Heald Sizematic, 1942 (3)
8″ x 48″ J. & L. Thread, 1941
6″ x 18″ Norton, Pl. Hyd., Late
No. 2 Cincinnati Centerless, 1943
Nos. 35 & 31 Excellos (2)
10″ x 48″ Cinci. Pl. Cyl., 1942

PLANERS

24″ x 24″ x 16′ Ingersoll Planer Type 4 swivel hds., 20 H.P. A.C. M.D.
30″ x 30″ x 14′ Cinci., 2 hds., M.D.
36″ x 36″ x 12′ Cinci. Hypro, 4 hds., var. voltage, AC dr., 1943.
42″ x 18″ x 16′ N.B.P. Frog & Switch with 50 h.p., AC, M.D.
48″ x 48″ x 24′ Gray, 4 hds., var. v., A. C., 1942
48″ x 48″ x 26′ N.B.P., 4 hds.
54″ x 48″ x 18′ N.B.P., 4 hds.
60″ x 60″ x 26′ N.B.P., 4 hds.
72″ x 72″ x 26′ N.B.P. 4 hds.
84″ x 84″ x 26′ Betts, 4 hds.
96″ x 96″ x 26′ Betts, 4 hds.
120″ x 96″ x 26′ Cinci., 4 hds.

PRESSES, PUNCHES, ROLLS, SHEAR

Multi Punch, No. 7 H. & J., 14″ throat
#20 Bliss O.B.I.
250 ton WATSON STILLMAN HOR. HYD. CRANKPIN AND FORCING PRESS
56 ton Diamond Grd. O.B.I., new, M.D.
55 ton Diamond Fly. O.B.I., new, M.D.
31 ton Diamond Grd. O.B.I., new, M.D.
30 ton Diamond Fly. O.B.I., new, M.D.
72″ Clev., S.E. Punch, 1¼″ x 1″
72″ x ⅜″ Bertsch 7 Roll Straightener, AC, M. D., new 1942
36″ x 16 Ga. Niagara, 18″ Gap
10′ x ¾″ Hilles & Jones 7 Roll Straightener, AC, M. D., late type
15′ x ¾″ Wickes Pyr. Rolls M.D.

MISCELLANEOUS

BOLT THREADER, 1″ Landis
GEAR SHAPER, No. 75 Fellows
HAMMER, 2500 Lb. Chambersburg, dbl. FR, air, forge
HAMMERS #4B & 4-1, Nazels, M.D.
KEYSEATER, No. 0 Baker, M.D.
KEYSEATER, No. 5 M & M
SAW, No. 9 Marvel, 10″ Capty.
SAW, 6″ Racine Oil-cut, 14′ Feed Rack
SHAPERS, 16″ G. & E. M.D. (2)
SHAPER, 24″ Milwaukee Motorized
SHAPER, 24″ Cincinnati, 1943
SLOTTER, 20″-24″ Dill, M.D.
SLOTTER, 48″ N.B.P., grd., late.

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LATE TYPE MACHINES

AUTOMATIC, 9/16″ Cleveland A (1943)	$2750.00
AUTOMATIC, ⅞″ Conomatic, 4 sp. (1940)	2975.00
AUTOMATIC, 1½″ Conomatic, 6 sp. (1943)	5975.00
AUTOMATIC, 2⅝″ Conomatic, 6 sp. (1943)	8500.00
AUTOMATIC, 1-1/16″ Cleveland B, M.D. (1943)	1750.00
AUTOMATIC, 2½″ Cleveland B, M.D. (1943)	2750.00
AUTOMATIC, 3¾″ Cleveland A (1944)	7950.00
AUTOMATIC, #0G B&S (1944)	3500.00
BROACH, Foote Burte 48″ stroke (1943)	2950.00
DRILL, 6 sp. Canedy Otto, M.D. (1943)	1950.00
DRILL, Natco, 14 sp. type E-5 (1943)	1975.00
DRILL, Kingsbury 6 unit horiz. (1943)	2975.00
DRILL POINTER, #510 Oliver (1942)	575.00
ENGRAVER, Munitions, Gorton (1943)	450.00
GEAR CHECKER, Fellows red liner (1943)	750.00
GEAR CUTTER, Waltham, M.D. (1944)	750.00
GEAR GRINDER, 9″ P&W (1943)	995.00
GEAR GRINDER, 10″ Detroit (1943)	995.00
GEAR HOBBER, Barber Colman type S. (1943)	1350.00
GEAR LAPPER, 15″ Red Ring (1941)	1975.00
GRINDER, #5 B&S (1943)	1975.00
GRINDER, Rotary #18 Gallmeyer (1942)	750.00
GRINDER, 6x18 Cincinnati (1943)	1975.00
GRINDER, 6x18 Landis (1941)	1750.00
GRINDER, Centerless Heald #74 ('43)	3450.00
GRINDER, Heald #72A3 (1943)	2750.00
HOISTS, Electric, 1 ton Budgit (1943)	145.00
LATHE, 13x5 LeBlond Rapid Production, M.D. (1943)	1350.00
LATHE, 15x6 LeBlond (1942)	1475.00
LATHE, 17x5 LeBlond Rapid Production, M.D. (1943)	1475.00
MILL, Vertical Cincinnati No. 08 (1943)	975.00
MILL, Van Norman No. 3-SP, M.D. (1944)	3975.00
MILL, No. 33 Stoker-unit, M.D. (1943)	2250.00
MILLS, U. S. M-60 Multimill (1943)	675.00
MILL, 1-12, Cincinnati (1943)	1650.00
MILL, 2-18 Cincinnati (1943)	2450.00
MILL, 2-24 Cincinnati (1943)	2875.00
MILL, 12 Brown & Sharpe (1943)	1650.00
PLANER, Cleveland openside 36x36x8 (NEW)	14500.00
TURRET LATHE, Simmons Micro-Speed, M.D. (1943)	1175.00
TURRET LATHE, 3R Gisholt (1943)	3500.00
TURRET LATHE, 4R Gisholt, 9½″ sp. (1943)	4950.00
TURRET LATHE, #3 B&O, bar feed (1943)	2475.00
TURRET LATHES (2), #7 B&O, M.D. (1943)	3500.00

MISCELLANEOUS

AUTOMATIC, No. 0 Brown & Sharpe	$ 495.00
AUTOMATIC, No. 00 Brown & Sharpe	475.00
AUTOMATIC, 2¼″ Cone 4 sp.	1475.00
AUTOMATIC, 2″ Cleveland 4 sp.	1275.00
AUTOMATIC, No. 2 Brown & Sharpe	675.00
AUTOMATIC, 2¾″ Cleveland A, 24,000 ser.	575.00
CRANE, 5 ton Shepard, 47′ span	2975.00
GEAR HOBBER, No. 3 Barber Colman	650.00
GRINDER, No. 1 B&S Universal	350.00
GRINDER, Surface No. 2 B&S, M.D.	395.00
GRINDER, Internal, Heald No. 72 Hyd.	575.00
HOIST, 1 ton Ruger, hyd. (NEW)	295.00
LATHE, 14x6 Hendey, Grd. Hd., M.D.	875.00
LATHE, 14x6 LeBlond, T. A., pan bed	675.00
LATHE, 24x8 LeBlond, Grd. Hd., M.D.	975.00
LATHE, 24x10 Greaves, Grd. Hd., T.A.	1475.00
LATHE, 28x8 Bridgeford	1175.00
LATHE, 36x14′ Houston, Grd. Hd., M.D.	1975.00
MILL, No. 3 Cincinnati vert., S.P.D.	1250.00
MILL, No. 5 Cincinnati plain, S.P.D.	1750.00
SHAPER, 22″x58″ Cincinnati, Trave. Hd.	975.00
TURRET LATHE, 2A W&S bar feed	675.00
TURRET LATHE, 1A W&S	575.00
TURRET LATHE, No. 6 W&S, bar feed	475.00

PRESSES — SHEET METAL MACHINES

BRAKE, 6′ D&K, power box, 10 ga.	$ 950.00
PRESS, Hyd., 60 ton HPM, steam platen	475.00
PRESS, Stake, 60″ long horn Bliss	675.00
PRESS, Hyd., 200 ton HPM, M.D. (1943)	4500.00
PRESS, No. 30 Bliss, 60 ton	875.00

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EX-CELL-O Thread Grinder #50—Like New
2 PRATT & WHITNEY Spline Millers—Good Condition
CINCINNATI Gear Burnisher—With Gears
18″ GLEASON Bevel Gear Cutter—Good Operating Condition
6″ x 80″ PRATT & WHITNEY Thread Milling Machine—Good Operating Condition
20″ x 10′ 8 Speed REED-PRENTICE Engine Lathe—Reconditioned
16″ x 10′ 8 Speed REED-PRENTICE Engine Lathe—Reconditioned
16″ x 8′ 16 Speed REED-PRENTICE Engine Lathe—Late Model, Reconditioned
14″ x 8′ 16 Speed REED-PRENTICE Toolroom Lathe—Late Model, Reconditioned
4′ Arm 9″ Column CARLTON Radial Drill
#2 PRATT & WHITNEY Hand Screw Machine, with 1″ collet capacity
#5 WARNER & SWASEY Turret Lathe, 12 Speed Head—Good Operating Condition
#3 Brown & Sharpe Vertical Milling Machine

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600 HP Westinghouse, ratio 3.76 to 1, excellent condition.

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Niles-Bement-Pond 2500#
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DIRECT MOTOR DRIVE
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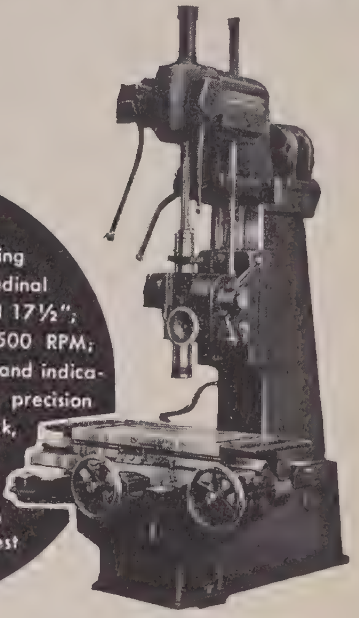

Fosdick Jig Borer, Model 30, Table working surface 18" x 36", longitudinal table travel 30", cross travel 17½"; twelve speeds from 60 to 1500 RPM; equipped with measuring rods and indicators, 16" power rotary table, precision boring head, Jacobs chuck, collets, etc. Motor and control 3 phase 50/60 cycle, 220/440 volt, 1500/1800 RPM. Latest Model.

AUTOMATICS

2G Brown & Sharpe, H.S. 1½" capacity. New, 1943.
9/16" RA-6 Acme-Gridley. New, 1943.
1⅝" 6 Spindle Greenlee. New in 1942.
3½" RA-6 Acme-Gridley. New, 1942.
6" 4 Spindle Conomatic. New, 1942.
★**Bullard Multaumatic, six spindle Model D, single index. Late Model.**

BORING MILLS

No. 42 Lucas Horizontal, 4" bar, with rectangular revolving table, star facing head, motor and control. New, 1942.
★**Universal Horizontal 4" bar, table type, with facing head, rotary table, boring bars, motor and control. New, 1943.**

BROACHES

No. CPC 6-30 LaPointe Hydraulic Vertical. New, 1941.
No. CPC 6-36 LaPointe Hydraulic Vertical. New, 1943.

DRILLS

3' and 4' Dreses Radial, 11" column, enclosed head, 1938 model.
No. H3 Barnes Hydram, 8 speed. New, 1942.
42" Cincinnati-Bickford, single spindle.
KH 2 Allen, 6 spindle. New, 1943.
No. 3 Baush Multiple Spindle.
Barnes Horizontal Deep Hole, two spindle.

GEAR CUTTERS

No. 6 Gleason Gear Tester.
12" Gleason Straight Bevel Gear Generator. Late model.
No. 7A, 7125A Fellows Gear Shapers.
No. 615A, Fellows Gear Shapers.
No. 12 Barber Colman Hobber.

GRINDERS

No. TG615 Jones & Lamson Thread Grinder. New, 1943.
No. 2 & No. 3 Cincinnati Centerless, Filmatic spindle, 1941.
★**14" x 48" Cincinnati Universal, Filmatic bearing, internal spindle. New, 1942.**
No. 3 Brown & Sharpe Universal. New, 1943.
4" x 18" Landis, Type H.
6" x 18" Cincinnati, Filmatic Bearing.
10" x 72" Norton Cylindrical.
10" x 36" Landis Hydraulic. New, 1943.
No. 22 Heald Rotary Surface Grinder. New, 1943.
No. 18 Blanchard, 30" chuck. New, 1942.
16" x 16" x 48" Thompson Model C, Surface.
3B Abrasive, with chuck. New, 1943.
No. 5 Brown & Sharpe Surface. New, 1942.
6" x 12" x 18" Thompson Surface Grinder. New, 1942.
No. 2B Reid Surface, for wet grinding.
No. 16CP16 Bryant Hydraulic Internal Grinder, New, 1942.
No. 75A Heald Internal. New, 1943.
No. 72A3 & 72A5 Heald Internal. New in 1943.

LATHES, ENGINE

Hendey 12" x 30", g.h.
Reed Prentice, 14" x 30" g.h.
Lodge & Shipley Tool Room, 14" x 54", rel. att. New, 1943.
Reed Prentice 14" x 78" Toolroom. New, 1943.
American Pacemaker, 16" x 30". New, 1942.
Reed Prentice 16" x 54". New, 1943.
Sidney 18" x 54". New, 1943.
Lodge & Shipley 20" x 48". New, 1943.
★**Bertram 28" x 240" "Timesaver", two carriages, with rapid traverse. Canadian made from Niles patterns. New, 1942.**
American 30" x 20' g.h.
Lodge & Shipley 48" x 54", cone driven.
Carroll Jamieson 18" x 5', O.D.
South Bend 14½" x 6'. New, 1944.
Lo-Swing, models IMP and R.

LATHES, TURRET

Warner & Swasey No. 4A, with chuck, 7½" hole.
★**Warner & Swasey No. 2A, preselector, Cross sliding turret. New, 1943.**
Warner & Swasey No. 1A, preselector, cross sliding turret. New in 1942.
Jones & Lamson No. 9A. New, 1943.
Gisholt No. 2L, cross sliding turret. New, 1943.
Acme No. 1 Universal, saddle type. New in 1941.
Bardons & Oliver No. 7 Ram Type, Bar feed and tooling. New in 1942.
Foster No. 5 Universal, Bar feed. New, 1943.
Gisholt No. 4 Universal, Hydraulic speed selector.
Warner & Swasey No. 3 Universal. New, 1942.
Bardons & Oliver No. 3 Universal, motor in base. New, 1941.
Warner & Swasey No. 2, oversize. New, 1942.
Bardons & Oliver No. 2, bar feed. New, 1941.
Bullard, 36" Spiral Drive VTL. New, 1943.
Bullard 42" New Era, VTL.

MILLS

★**Cincinnati No. 4 Universal, High Speed Dial Type with rotary table, vertical attachment, slotting attachment, dividing head, motor and control. New, 1942.**
Cincinnati No. 2M Universal.
Brown & Sharpe No. 2A Universal. Late Type.
Brown & Sharpe No. 1 Universal. New 1941.
Kempsmith Maximiller Plain, No. 3.
Brown & Sharpe No. 3B Plain. New, 1943.
Brown & Sharpe No. 2B Plain.
Cincinnati No. 2MH Plain, latest model.
Cincinnati Hydrotel 28" x 60", depth & tracing.
Milwaukee No. 3H Vertical. Latest model.
Milwaukee No. 2K Vertical. New, 1942.
Cincinnati No. 2 Vertical. New, 1940.
Cincinnati No. 08 and 2-18 Rise and Fall.
Cincinnati No. 1-12 Automatic.
Cincinnati No. 3-36 Hydromatic.
Cincinnati No. 34-36 Hydromatic High column with Hydrotel.
DeVlieg Supermill No. 31B.
Brown & Sharpe No. 12. New, 1942.
Whitney Hand Mill, No. 6.

MISCELLANEOUS

Jones & Lamson Comparator.
Cleveland Rigidturner, No. 616.
18' x 18" Marvel Hydraulic Saw.
18" x 18" Racine Hydraulic Saw.
12" x 12" Peerless High Speed Saw.
Bertsch 6' x ½" Bending Roll.
No. 26F Norton Hydrolap.
No. 5B Standard OBI Press. New.
No. 8-6 Zeh & Hahneman S. S. Geared Press.
Toledo No. 41 Horn Press.
Tapper, Leland Gifford 3' Radial, No. 3 M.T. New, 1941.
24" Cincinnati Worm Feed Rotary Table.
Dodds Dovetail Machine, 15 spindle.

PLANERS AND SHAPERS

Cincinnati Planer, 42" x 42" x 20', Four heads D.C.
Cincinnati Planer 52" x 36" x 40' four heads, box table. D.C. motor drive.
6" Ammco Bench Shaper.
Cincinnati 24" Shaper, Universal table and power down feed. New, 1943.
Smith & Mills 28" Shaper.
Cochrane & Bly No. 14 Vertical Shaper. New, 1942.
Pratt & Whitney 6" vertical shaper. New, 1943.

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BROACHES

Twin Ten Oilgear duplex
No. 3XA Oilgear
No. 3L Lapointe
9 ton American horizontal
30 ton No. V48 American vertical
No. 1 Foote Burt duplex vert. surf.

DRILLS

21″ & 24″ Cincinnati Bickford upright
Nos. 121, 217, 315 Baker heavy duty
No. 217 Baker 3 spindle
6′-15″ Cincinnati Bickford radial
22″ Barnes All Geared 2 spindle
20″ Colburn Mfg., 1 and 4 spindle
3″, No. D3 Colburn heavy duty
No. B4A Natco multiple Holetapper
8 spdl. No. 11 Natco multiple
22 spdl. No. 14 Natco multiple
34 spdl. No. 30 Natco multiple
42 spdl. No. B16 Natco multiple
24 spdl. No. 2 Baush multiple
12 spdl. No. 39 Natco rail type

GEAR MACHINERY

Nos. 8H, 12H & 16HS G.&E. hobbers
No. 12 Barber Colman hobbers
No. 130 Cleveland Rigid hobber
Nos. 1, 5A & 5AC Lees Bradner hobbers
48″, No. 4 B.&S. automatic spur
24″ Flather automatic spur
No. 5M Adams Mfg. hobber
No. 12 Gleason 2 tool bevel rougher
10″ Pratt & Whitney 2 wheel grinder
No. 7 Fellows gear shapers
18″ Gleason testers & lappers
8″ Red Ring gear lapper
No. 50 Cross tooth rounder
Lipe & Cimatool tooth rounders

GRINDERS, DISC

20″, No. 208 Besly
26″, No. 226 Gardner
30″, No. 86 Gardner horizontal
15″, No. 115 Gardner opposed disc
30″, No. 230 Hanchett opposed disc

GRINDERS, INTERNAL

Grenby toolroom
Majestic toolroom
Bryant Nos. 16CP16, 16-28, 16F28 & 16-38
Heald Nos. 75, 75A, 72A3 & 72A5 plain
  Nos. 72A3 Sizematic
  No. 72 Electric indicator automatic

LATHES, ENGINE

14″x 6′	Mulliner
14″x 6′	Lodge & Shipley
15″x 6′	Porter McLeod
18″x 8′	Lodge & Shipley
36″x 16′	Bridgeford

MILLERS, PRODUCTION

Nos. 1, 1M & 2 Kent Owens hand
No. 28-60 Cincinnati Hydrotel
No. 45 Productomatic
No. 1 Davis & Thompson drum type
4″ Pratt & Whitney spline
4″ Rice Barton spline
No. MM-1-60 U.S. Multi-Millers
30″ Newton continuous rotary
30″, 42″ & 84″ Ingersoll continuous rotary
Small Ingersoll drum type
24″x 24″x 16′ Ingersoll adj. rail planer type
24″x 20″x 20′ Ingersoll planer type
51″x 21″x 20′ Ingersoll planer type
Types C&D Hall planetary thread
No. 3 Planomill thread
7½″ x 11½″ Hanson Whitney thread
No. 4 Lees Bradner univ. thread
No. CT 36 Lees Bradner thread
No. 32 Kempsmith Lincoln type
Nos. M18, M24 & 12-24 Kearney & Trecker
No. 08 Cincinnati, horiz. or vert.
12″ Cincinnati, plain Mfg.
24″ Cincinnati, plain or duplex
Nos. 1-18, 2-18 & 2-24 Cincinnati automatic
Nos. 2-18 & 2-24 Cincinnati Rise & Fall
Nos. 3-24, 4-36, 4-48, 5-48, 34-36, 56-72 & 56-90 Cincinnati Hydromatic
No. 12 Brown & Sharpe Mfg.
48″ Cincinnati duplex automatic
No. 33 Sundstrand openside, 2 vertical spindles, 18″ x 140″ table, adjustable rail.

MILES MACHINERY CO.
SAGINAW, MICH.

BARGAINS! BARGAINS!

MACHINE TOOLS, CRANES, PUMPS, TRANSFORMERS

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NILES 100″; 2 swivel heads; M.D.

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BRIDGEFORD 36″ x 24′ centers; geared; M.D.
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NILES 26″ x 72″ centers; geared head; M.D.
NILES 48″ x 87′ centers; comb. boring & turning
NILES 60″ x 10′ centers; geared head; NEW 1943
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NILES-BEMENT-POND 72″ x 63′ centers; Comb. Boring & Turning; M.D.
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WARNER & SWASEY 1A, 3A, Universal, M.D.

MILLING MACHINES

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CINCINNATI 4-48 Hydromatic, 1943
LeBLOND No. 4 Plain, Belted, M.D.
BROWN & SHARPE No. 5 Vertical, M.D.
SUNSTRAND 3A Duplex, New 1943
BRIGGS 2A Plain, Hydraulic, New 1940
INGERSOLL 32 x 30 x 12′ Adjustable, Slab, M.D.
SUNSTRAND 3A, Vertical, Rotary, New 1943
SUNSTRAND No. 3, Vertical & Channel, New 1943

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CHANDLER 36″ x 36″ x 20′, 2 heads, A.C., M.D.
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Rapid Traverse, D.C., M.D.
NILES 48″ x 48″ x 16′, 4 heads, A.C., M.D.
NILES 54″ x 54″ x 18′, 4 heads, box table, D.C., M.D.
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GRINDER, Internal, No. 72A5 Heald, M.D.
GRINDER, Knife, 120″ Springfield, M.D.
GRINDER, Roll, 24″x240″ Norton
GRINDER, Surf, No. 5 Abrasive, 14″x48″
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HAMMER, Bd. Drop, 1000#, Billings & Spencer
HAMMERS, Steam Drop, 4000 & 5000# Erie (Late)
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MILLER, Vert. No. 3 Cincinnati
MILLER, Vert. No. 4 Kempsmith, table 18x76″
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PLANER, 72″x72″x12′ N-B-P, 4 hds., M.D.
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SHAPER, 24″ Stockbridge, M.D.
SHAPER, 32″ Smith & Mills, M.D.
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36" x 20' Putnam, S.C.G., D.C., M.D.
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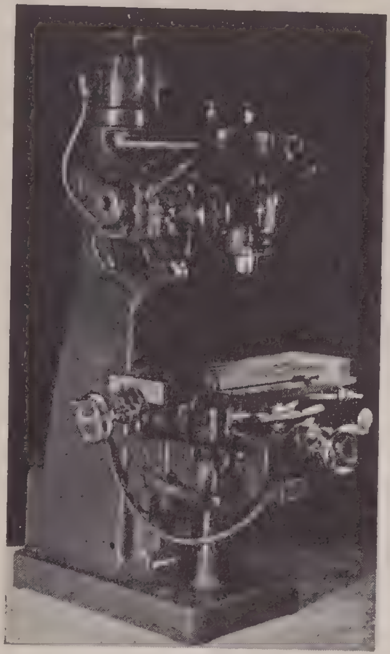

High Speed Vertical Mill

RADIALS

3', 9" Cincinnati-Bickford, 1943
Carlton 8', 19" col., motor on arm
4', 5', 6' American Triple Purpose
6' Cincinnati-Bickford 4', 5' Western, S.P.D.

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2⅝" Conomatics 6 Spindle, Tooled, Late
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Cincinnati #4 Vert. Dial Type
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No. 3S Cincinnati S.P.D., rapid traverse
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Hall Planetary Model D Thread Miller
Becker Nos. 3, AB, 5, 6, Vert.
Nos. 3, 4 Cincinnati Vert., 2
P. & W. No. 12, 30" Profiler, M.D., 12B-2SP.
K. & T. B. & S. Nos. 2, 3
B. & S. No. 3 Vert.
Gorton 8D, 9J, Vert., M.D., 9J Duplicator
No. 2, 2A Brown & Sharpe Univ.
No. 1 Cleveland Vert. & Univ.
No. 2B K. & T. Univ.

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Mc Kenzie Chip Separator, Barrett Extractor
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GRINDER, Norton Type C, 6" x 18" (1945)
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MILLER, #3H Kearney & Trecker Vertical (1943)
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1/16" - 1 x 19	Galvanized	500 Lbs.	451,605 Ft.	In Stock	.020 Ft.	.008 Ft.	.006 Ft.	
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3/32" - 7 x 7	Galvanized	920 Lbs.	11,461,217 Ft.	In Stock	.042 Ft.	.0168 Ft.	.0126 Ft.	.01 Ft.
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1/8" - 7 x 19	Galvanized	2,000 Lbs.	170,000 Ft.	In Stock	.085 Ft.	.034 Ft.	.0255 Ft.	
5/32" - 7 x 19	Tinned	2,800 Lbs.	85,837 Ft.	In Stock	.092 Ft.	.037 Ft.		
5/32" - 7 x 7	Galvanized	2,600 Lbs.	409,040 Ft.	In Stock	.056 Ft.	.0224 Ft.	.0168 Ft.	
3/16" - 7 x 19	Galvanized	4,200 Lbs.	897,692 Ft.	In Stock	.104 Ft.	.04 Ft.	.035 Ft.	.03 Ft.
7/32" - 7 x 7	Galvanized	4,600 Lbs.	1,425,914 Ft.	In Stock	.075 Ft.	.03 Ft.	.025 Ft.	.02 Ft.
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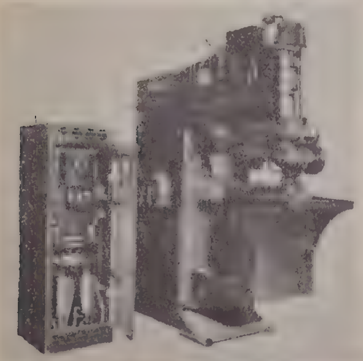

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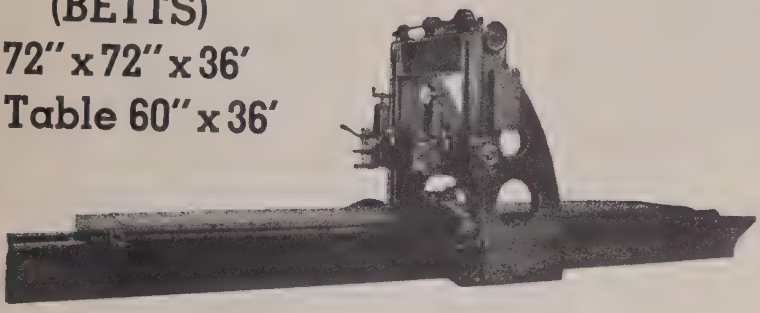

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84" x 72" x 12'	Cincinnati D.H; 4 heads
30" x 30" x 8'	Cincinnati D.H; 1 head
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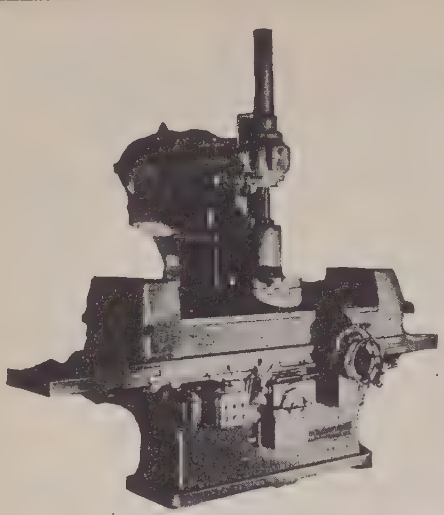

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2, 3, 5, 7½, 12 & 15 TON MONORAIL HOISTS

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1 type Q Electromelt Arc Melting Furnace 1½ ton per hour rating, complete with transformer 1200 KVA and all operating controls.

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Immediate Shipment

(2) #102 Universal Coil Winding Machines, one 3 head machine (NEW 1941), one 4 head machine (NEW 1943), both arranged for motor drive, less motor, with automatic counters.

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1 old style openhearth charging machine, 5 tons capacity. Machine will be put in shape before delivery.

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No. 2 Brown & Sharpe
No. 61 New Britain, 6 Spdl-2¼"

BORING MILLS
34" King
42" Bullard New Era
52" King
72" Cincinnati
72" Niles Extra Heavy
84" Betts

DRILLS
No. D-8 Colburn, No. 6 M.T.
No. 2 LMS—26"—2 Spdl. L-G (1945)
No. 2MA-6—15"—4 Spdl. Avey
No. 2 LMS—26"—4 Spdl. L-G
No. 4 BL Natco—36 spdls.
7'-15" Col. American Univ. Radial

GEAR MACHINERY
No. 61-A Fellows Gear Shaper (1942)
No. 615-A Fellows Gear Shaper (1942)
No. 712 Fellows Auto Indexing (1942)
11" Gleason Bevel Generator
72" Cincinnati Gear Cutter

GRINDERS
4"x12" Landis, Model H (1942)
4"x18" Landis, Model H (1942)
6"x18" Norton Type C Plain (1943)
6"x30" Norton Type C Plain (1943)
10"x18" Norton Type C Plain (1943)
10"x18" Cincinnati Plain (1942)
Norton Motor Driven Plain Grinders
6"x18" ——— to ——— 240"
10"x24" Landis Universal
12"x36" Landis Univ. Type LCH (1945)
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24"x24"x84" Mattison Hydr. Surf
No. 34 Abrasive Surf. (1943)
No. 22—12" Heald Rotary Surface
No. 25A—24" Heald Rotary Surf. (1943)
72A-3 Heald Internal Gdr. (1943)
72A-5 Heald Internal Grinder (1942)
No. 5 Bryant Internal Grinder
10"x72" Colonial Broach GDR.

HORIZONTAL BORERS
No. 31 Lucas 3" Bar
No. 3A Universal 3" Bar
Rockford, 3⅛" Bar
No. 48-A Heald Borematic

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14"x6' Hendey
15"x5' Sebastian
16"x54" Centers LeBlond
18"x6' American
22"x48" Centers Monarch (1942)
36"x30' Lodge & Shipley
36"-48"x16' Lehman Hydrotrol (1945)
50"x17' Centers LeBlond (1942)
8"x15" Sundstrand, Model B (1942)
8"x15" Sundstrand, Model D (1943)
8"x15" Sundstrand, Model E (1940)
10"x22" Sundstrand, Model AA (1943)
12" x 18" Lipe-Carbo
16"x33" Fay Automatics (1942)
20"x25" Fay Automatics (1942)

MILLING MACHINES
No. 2 B & S Univ., Cone Dr.
No. 2H Milwaukee Vert. (1942)
No. 2 Cincinnati Vert. (1942)
No. 2M Cincinnati Vert. (1941)
No. 3 Milwaukee Vert.
No. 3 Cincinnati High Power Vert.
No. M-18 Milwaukee Simplex (1942)
No. M-24 Milwaukee Simplex (1942)
No. 1-18 Cinn. Mfg. (1940)
No. 2-18 Sundstrand Electromil (1942)
No. 4-48 Cinn. Plain Hydromatic (1942)
No. 45-48 Cinn. Plain Hyd. Tracer (1942)
No. 56-90 Cinn. Plain Hydromatic (1943)
4"x9" Hanson-Whitney Thread Miller
4½"x12" Pratt & Whitney, Model C
6"x20" Pratt & Whitney, Model C
6"x36" Lees-Bradner Thrd Miller (1942)
6"x48" Pratt & Whitney Thrd Miller
6"x132" Pratt & Whitney Thrd Miller
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24"x24"x12' Ingersoll Adj. Rail
72"x48"x12' Ingersoll Adjustable Rail

TURRET LATHES
No. 2 B. & S. Screw Machine, Wire Feed
No. 5 Warner & Swaseys (1942)
No. 5 Bardons & Oliver (1942)
No. 5 Foster, Bar Feed (1942)
No. 2A Warner & Swasey (1942)
1-H Libby, Extra Long Bed
No. 1-H Libby, 6¼" Spdl. Hole
No. 4A Warner & Swasey, 7½" Spdl. Hole

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No. 0 Bakewell Tapper
No. 20 Bliss O.B.I.
Model H-7 Micromatic Hone
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- 42" x 42" x 12' N.B.P. 4 heads, 230 V.D.C.

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- 3½' Cincinnati-Bickford
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- No. 3 & 5 Cincinnati Plain
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- 24" & 36" Bullard New Era
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- 84" Niles-Bement-Pond
- 96" Niles-Bement-Pond
- 10' Betts, Side Hd.
- 10' & 12' N. B. P. 2 heads
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- No. 7 Barrett Cylinder, 8" Bar

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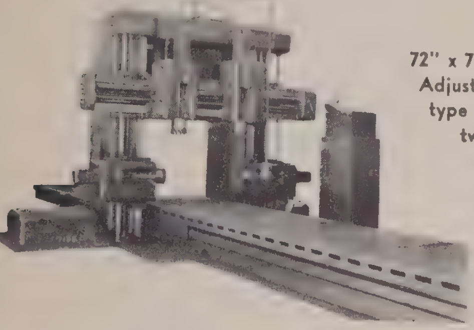
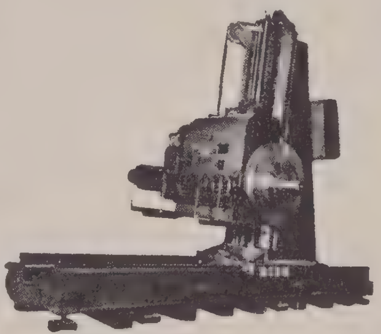


72" x 72" x 30' Ingersoll Adjustable Rail Planer type Milling Machine, two rail heads, two side heads, late type.



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- LeBlond 36"x32' Geared Head
- Putnam 42"x16' Geared Head
- Putnam 42"x50' Geared Head

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- Van Norman #2L Plain Horiz. Miller
- Cincinnati #3 Universal Miller Vert. Hd. Div. Hd. Vise, M/D

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1 special duplex milling machine, 5 hp motor on each spindle. 40-in. stroke on table. 24-in. vertical travel. All Vickers hydraulic feeds. Machine in perfect shape.

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Modern High Pressure Hydraulic Pumps, Presses, Gear Reducers

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16—15" OD, 11" ID x 20' long 4000 pounds pressure seamless steel accumulator bottles.

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B4B NATCO 48-spdl. Vertical Drill, #2MT, 22" x 36" area

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#72-A-3 Heald SIZE-MATIC Internal Grinder

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#372-53" Besly Disc Grinder

6" x 18" Norton "C" Grinder

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Ajax and Acme Upsetters, not susp. slides, ¾" and larger

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Single and Double End Punches, various throat depths and caps. Wide variety

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400-tons Hydraulic Wheel Press, 48" betw. bars

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200 Ton Caldwell Hydraulic Wheel Press

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Cincinnati 36" x 36" x 16 ft. Planer, M.D.

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PLANER, 72"x72"x12' N-B-P, 4 hds.

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1	1000		Whse.	CW	2300	720
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1	300		Whse.	CW-885	440	1750
1	250		G.E.	MT-563Y	550	880
1	250		G.E.	MT-424Y	4000	257
1	200		G.E.	IM-16	440/550	435
2	100		G.E.	IM	2200	435
1	75		F.M.	By-H16B	2200	1750
1	60		Cr. Wh.	123AG	220	700
3	50		Whse.	CI-638A	220	870
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1	250		G.E.	KT-559	440	1750
1	250		G.E.	IK	440	600
1	200	(NEW)	G.E.	K	2300	1200
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2	3500		G.E.	TS	2300	257
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2	2000		Whse.		2300	120
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Shepard 30'6" Span
Shepard 56' Span
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Lane 60' Span
Sellers 16' Span
Crane 72'3" Span
15-TON
Alliance 68'10½" Span
Bedford 34½' Span
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Bedford 70' Span
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30-TON
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Northern 75' Span
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Euclid 56' Span
Shepard 60' Span
40-TON
Crane 70' Span
75-TON
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60	G.E.	C.int.	480/1100
50	West.	SK	250/1000
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40	G.E.	CDM-1441	250/1500
35	West.	SK-160	400/1600
25	G.E.	RF	400/1600
25	G.E.	RF	300/1200
20	G.E.	RF-12	400/1200
15	West.	SK-93	600/1200
10	G.E.	RF-10	600/1800
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Overhead Traveling Crane

Alliance and Morgan steel mill cranes, 10 to 40-ton capacity, all spans up to 102'0" A.C. and D.C. ***Send for special list.***

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In Stock—Immediate Shipment—Rebuilt and Guaranteed

OVERHEAD ELECTRIC TRAVELING CRANES

Tons	Make	Span	Current
5	Northern	21'0"	230-VDC.
5	Northern	25'0"	230-VDC.
5	Milwaukee	59'3"	230-VDC.
10	Northern	37'11"	230-VDC.
10	Niles	37'10"	220-VDC.
20/7½	Shaw Box	90'0"	230-VDC.
25	Aliance	55'0"	230-VDC.
35/10	Morgan	60'0"	230-VDC.

SQUIRREL CAGE MOTORS

3-PHASE 60-CYCLE

Qu.	HP.	Make	Type	Volts	RPM.
1	20	G.E.	I-K	220	565
1	20	Whse.	CS	550	1740
2	25	G.E.	KT-332	220	865
1	25	G.E.	I-K	220	1200
1	30	Whse.	CS	550	900
1	40	F.M.	H-12-D	220	860
1	40	G.E.	I-K	440	900
2	40	Al. Ch.	AR	440	860
2	40	F.M.	H-12-C	440	1200
1	40	Whse.	CS659	2200	1760
1	50	G.E.	I-K	440	695
1	50	F.M.	HJ	440	600
1	50	F.M.	H-16A	440	900
1	50	Ideal	445	440	1750
1	60	Whse.	CS607	440	880
1	75	Whse.	CS	440	1750
2	75	Al. Ch.	AR	2200	1765
4	100	F.M.	HS	440	880
3	100	G.E.	KT	2200	900
2	100	Whse.	CS760	2300	1170
1	100	G.E.	I-K	440	1800
1	125	Al. Ch.	AR	440	435
2	125	C.W.	126Q	440	430
1	125	Whse.	CS761	440	1750
1	125	Al. Ch.	AR	2200	1750
2	135	G.E.	KT-542Y	440	1180
1	150	G.E.	I-K	2200	720
1	250	Whse.	CS	2200	1200

SLIP RING MOTORS CONSTANT DUTY

3-PHASE 60-CYCLE

Qu.	HP.	Make	Type	Volts	RPM.
2	5	Al. Ch.	ARY	440	680
1	10	Howell		440	600
2	15	G.E.	I-M	220	1125
1	15	G.E.	MT-322	440	900
1	20	G.E.	MT-326	220	900
1	25	G.E.	MT-332	2200	900
4	25	G.E.	MT-526	440	840
1	25	Al. Ch.	ARY	2200	860
2	25	Whse.	CW-4810	440	1750
1	30	Al. Ch.	ARY	440	900
1	30	Whse.	CW	440	1160
1	40	Al. Ch.	ARY	2200	435
3	40	G.E.	MT-346	550	560
3*	40	G.E.	I-N	600	1170
1	50	Al. Ch.	ARY	2200	490
2	50	G.E.	MT-536	2200	1150
1	75	G.E.	MT-548	1200	440
1	75	Al. Ch.	ARY	1750	440
1	100	G.E.	MT-356	440	865
1	150	G.E.	I-M	1750	2200
1xx	200*	G.E.	I-M	2200	580
1	200	G.E.	I-M	550	585
1	200	Whse.	CW-873	440	1175
1	300	G.E.	MT-412	2200	360
1	300	G.E.	MT-412	440	360
1	300	Al. Ch.	ARY	2200	505
1	300	G.E.	I-M	2200	1200
1	400	Al. Ch.	ARY	2200	505
1xxx	600	G.E.	MT-412Y	2200	720
1xxx	750	G.E.	MT-414Y	2200	720
1xxx	800	Al. Ch.	ARY	2200	440
1xxx	1200	Whse.	CW	2200	590

*—40-Cy. xx—3-Bearing. xxx—Mill type 2-pedestal bearing on cast iron base, complete with reversing primary and magnetic secondary control. Will supply any above motors with control ENGINEERED for your requirements.

SYNCHRONOUS MOTORS

3-PHASE 60-CYCLE

Qu.	HP.	Make	P.F.	Volts	RPM.
2	50	G.E.	.8	2200	600
1	60	G.E.	.8	440	1200
1	100	Ideal	.8	220	900
1	100	Whse.	1.0	2200	1200
1	125	El. Mchy.	1.0	440	400
1	125	Whse.	.8	440	1200
1	150	G.E.	.1	2300	900
1	500	G.E.	.8	2200	720
1	885	G.E.	.1	11400/6600	514

MOTOR GENERATOR SETS

3-PHASE 60-CYCLE

Qu.	KW D.C.	Make	RPM.	Volts D.C.	Volts A.C.
1	5½	G.E.	1800	250	220/440
1	9	G.E.	1800	250	220/440
1	15	Al. Ch.	1200	250	220/440
7	25	Whse.	1200	120/240	220/440
3	50	Whse. (3-U.)	1200	120/240	440/2200
2	35	G.E.	1800	125	440
1	50	Lo. Al.	1200	120/240	440/2200
1	75	Whse.	1200	125	440
1	75	Al. Ch.	900	250	220/440
2	94	G.E.	1200	60	440
1	100	Al. Ch.	900	125/250	2200
1	150	Rel.	1200	250	2300/4150
1	200	G.E.	1200	250	2300/4150

TRANSFORMERS (OIL-COOLED)

Qu.	K.V.A.	Make	Voltage	PH.	CY.
2	10	Whse.	2400/480/240	1	60
2*	13	Kuhlman	480/240	1	60
1	25	Al. Ch.	2300/460/230	1	60
3	25	G.E.	2200/1100/600	1	40
1	30	G.E.	2200/1100/600	1	40
2*	37½	Whse.	460/230-230/115	1	60
2	50	Wagner	13200/11880-575/287	1	60
3	50	Al. Ch.	22000/220	1	60
1*	110	El. Fur.	2300-110/94/62/55	1	60
3	130	G.E.	19000/9500-550/2200	1	60
3	165/247	G.E.	38100/22000/11000-430/215	1	60
1	500	G.E.	2400/240	3	60
1	5000	Whse.	13200/480/240	3	60

*Air Cooled

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- 12—Gondola, All Steel, 50-Ton, 41-Ft.
- 12—Gondola, All-Steel, 50-Ton, 40-Ft. 6-In. Drop Door.
- 4—Gondola, Composite, 50-Ton, 48-Ft.
- 18—Gondola, Composite, 50-Ton, 41-Ft.
- 17—Hopper, Twin, All-Steel, 50-Ton.
- 2—Hopper, Covered, 30-Ton, Equipped with Fuller Type Outlet Valves.
- 25—Box, 40-Ton, Double Sheathed.
- 5—Box, 40-Ton, 40-Ft., Single Sheathed.
- 7—Box, 50-Ton, 50-Ft. All Steel.
- 8—Ore, Hopper Cars, All-Steel, Cross Dump, 50-Ton.
- 5—Caboose, 8-Wheeled, Steel Sills.
- 8—Flat, 50-Ton, 58-Ft., Steel underframe.
- 18—Flat, 40 & 50-Ton, 38 to 48-Ft.
- 9—Flat, 40-Ton, 60-Ft.
- 20—Passenger Cars, 60-Ft., All-Steel.
- 42—Dump, 20-Yd., Automatic Air.
- 31—Dump, 30-Yd., Automatic Air.
- 1—Tank, Class II, 3665-Gallon, Non-Coiled.
- 1—Tank, Class 11, 5086-Gal., Acid Car, 50-Ton.
- 3—Tank, Class II, 8,000-Gallon, Non-Coiled.
- 8—Tank, Class II, 7,850-Gallon, Non-Coiled.
- 2—Tank, Class 11, 8,000-Gallon, Coiled

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- 25—40 ton 36' steel u/f Stock Cars
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- 10—50 ton all steel Hopper Cars

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- 50 ton Porter switchers—steam
- 44 ton Davenport Diesel electric
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1/8"x14"	LONG—McKay Type 15	6,050#
5/32"x14"	LONG—McKay Type 15	7,800#
3/16"x14"	LONG—Airco #93	12,400#
1/4"x14"	LONG—Airco #78E	6,900#
1/4"x18"	LONG—Airco #78E	6,050#
1/4"x18"	LONG—GE-W 24	3,950#
1/4"x18"	LONG—Murex-FHP	13,250#
5/16"x18"	LONG—McKay #16	30,000#
5/16"x18"	LONG—Lincoln #7	2,500#
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Pcs.	Section	Body	Weight
5 Pcs.	25" Round Corrugated	100" Body	75,400#

SAE 4060

Pcs.	Section	Body	Weight
5 Pcs.	8¼" Square	67" Body	5,181#

SAE 4120

Pcs.	Section	Body	Weight
6 Pcs.	20" Octagon Fluted	91" Body	41,570#
1 Pc.	21" x 23" Rectangular	72" Body	8,600#

SAE 4125

Pcs.	Section	Body	Weight
8 Pcs.	21" x 23" Square	72" Body	70,990#
4 Pcs.	25" Round Corrugated	100" Body	59,520#

SAE 4130

Pcs.	Section	Body	Weight
2 Pcs.	36" Octagon Fluted	100" Body	51,420#

SAE 4135

Pcs.	Section	Body	Weight
2 Pcs.	20" Octagon Fluted	91" Body	14,230#
9 Pcs.	21" x 23" Rectangular	72" Body	78,930#
3 Pcs.	41" Octagon Fluted	78" Body	80,290#

SAE 4145

Pcs.	Section	Body	Weight
15 Pcs.	20" Octagon Fluted	91" Body	116,010#
8 Pcs.	21" x 23" Rectangular	72" Body	69,920#

SAE 4325

Pcs.	Section	Body	Weight
2 Pcs.	41" Octagon Fluted	78" Body	53,930#

SAE 4330

Pcs.	Section	Body	Weight
8 Pcs.	20" Octagon Fluted	91" Body	56,550#
14 Pcs.	21" x 23" Rectangular	72" Body	124,100#
5 Pcs.	25" Round Corrugated	100" Body	75,140#
6 Pcs.	41" Octagon Fluted	78" Body	166,220#

SAE 4335

Pcs.	Section	Body	Weight
5 Pcs.	21" x 23" Square (Piston Stock)	72" Body	43,960#

SAE 4345

Pcs.	Section	Body	Weight
7 Pcs.	21" x 23" Rectangular	72" Body	61,220#

SAE 4820

Pcs.	Section	Body	Weight
2 Pcs.	41" Octagon Fluted	78" Body	52,680#
24 Pcs.	21" x 23" Rectangular	72" Body	210,280#

SAE 8750

Pcs.	Section	Body	Weight
3 Pcs.	25" Round Corrugated	100" Body	44,340#
1 Pc.	25" Round Corrugated	100" Body	14,930#

(Sodium Sulphide Treated .07 Max.)

Navy Spec. "AN"
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Pcs.	Section	Body	Weight
1 Pc.	41" Octagon Fluted	78" Body	27,140#

Navy Spec. "H.G."
(Moly-Van. .40 Carbon)

Pcs.	Section	Body	Weight
1 Pc.	36" Octagon Fluted	119" Body	25,820#
1 Pc.	36" Octagon Fluted	101" Body	25,820#
1 Pc.	41" Octagon Fluted	78" Body	27,110#

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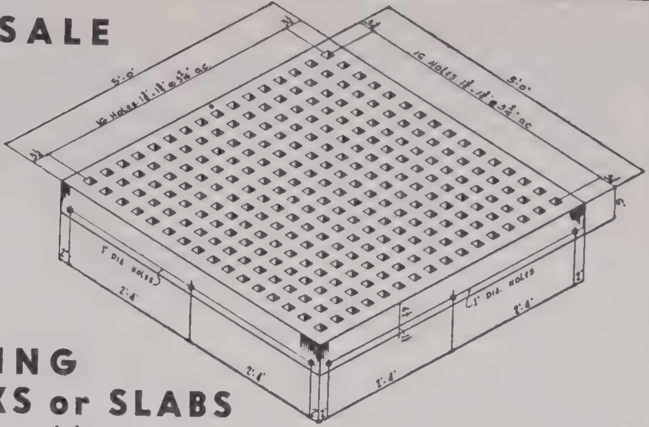

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50 Tons 5/32" and 3/16" dia. M.S. 14"

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20,000 Ft. ¾" OD x #22 ga. wall C.D. E.W. 15'10"
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1—20-Ton, Whitcomb, Gasoline, 0-4-0.

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2—45-Ton, Plymouth Diesel-Electric, 0-4-4-0 New 1942.

1—44-Ton, 360 H.P. General Electric Diesel-Electric, New 1940, ICC Condition, 4 Motor Drive, Caterpillar Engine T/E 27,280 lbs.

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13 Pcs. 5" Square Press Forged	10'/15'	14,985±
23 Pcs. 6" Square Press Forged	8'/20'	53,030±
18 Pcs. 6" Round Press Forged	8'/15'	24,670±
6 Pcs. 8" Round Press Forged	10'/15'	14,300±
2 Pcs. 9" Round Press Forged	15'/20'	7,280±

SAE 4120

3 Pcs. 5" Square Press Forged	10'/15'	3,080±
5 Pcs. 6" Square Press Forged	7'/15'	6,470±
2 Pcs. 8" Square Press Forged	10'/15'	4,930±
5 Pcs. 9" Square Press Forged	10'/15'	16,810±
2 Pcs. 9" Round Press Forged	15'/20'	6,950±

SAE 4125

29 Pcs. 3¾" x 4" Hot Rolled —Random	15'/30'	20,835±
79 Pcs. 2¾" Sq. Hot Rolled —Random	9'/17'	24,000±

SAE 4820

1 Pc. 18" Sq. Press Forged	14'	18,880±

NE 8750 (Sodium Sulphide Treated)

1 Pc. 14" Sq. Press Forged	9'2"	6,470±

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25 Pcs. 4" Square —Not Annealed	9'	14,000±
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163 Pcs. 4.724" Sq.—Random	6'/10'	108,908±

CARBON: .35/.45 CHROME: 9.0/10.5
SILICON: 1.9/2.6 NICKLE: .50 MAX.
MOLY: .7/1.20

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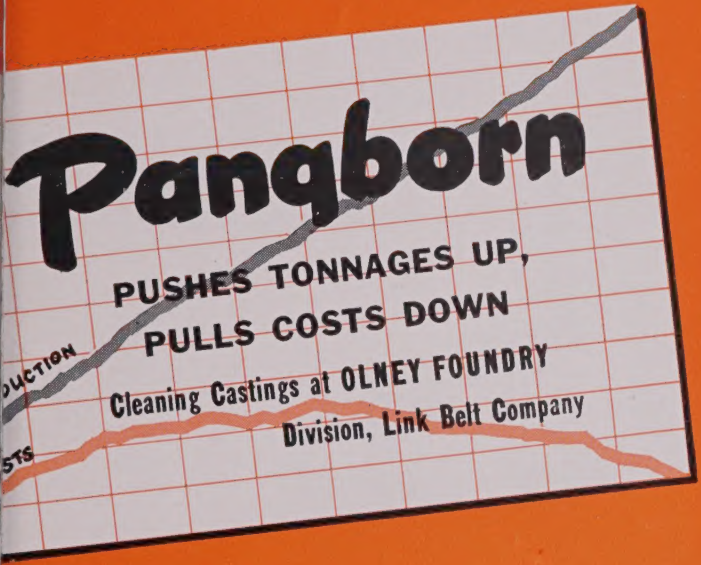
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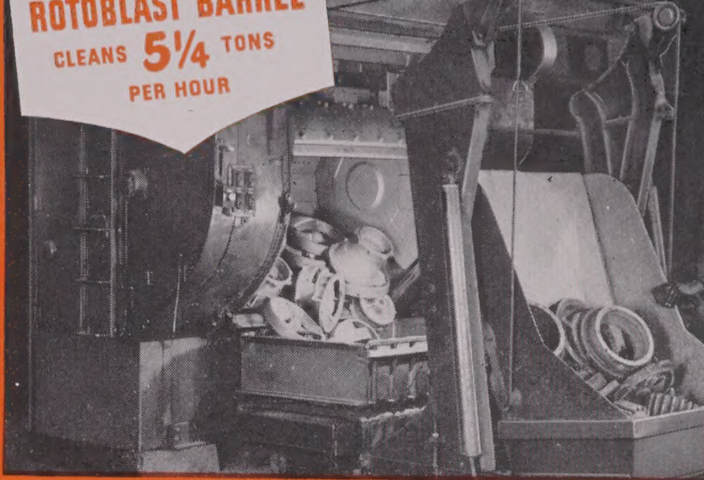

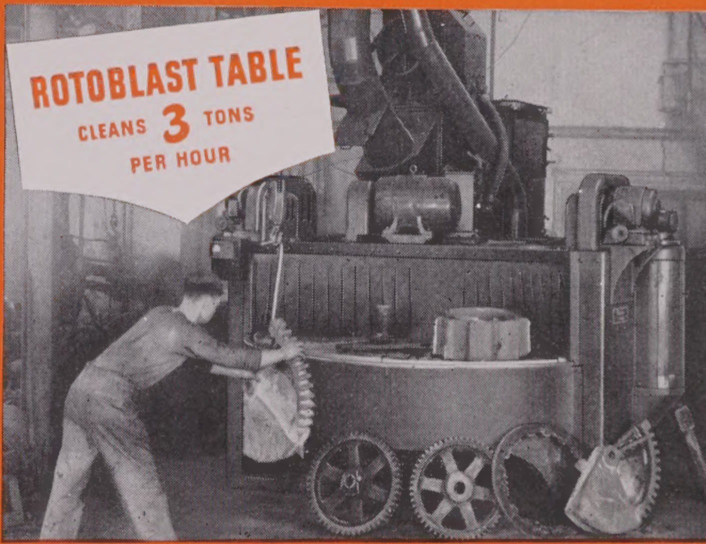

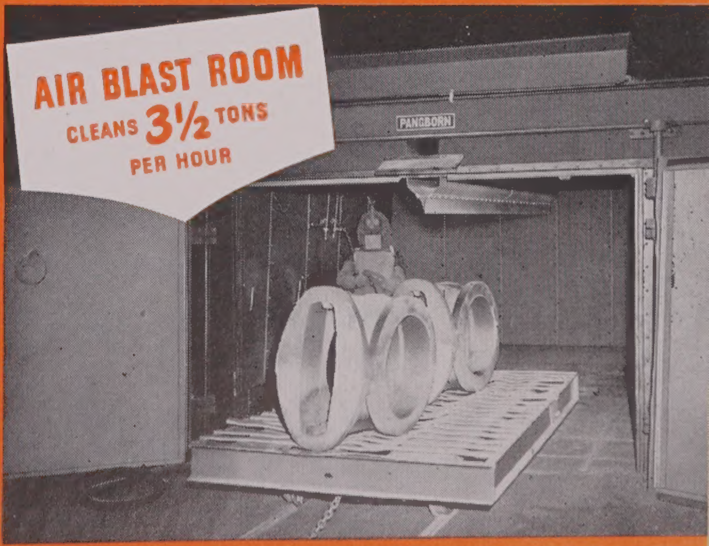

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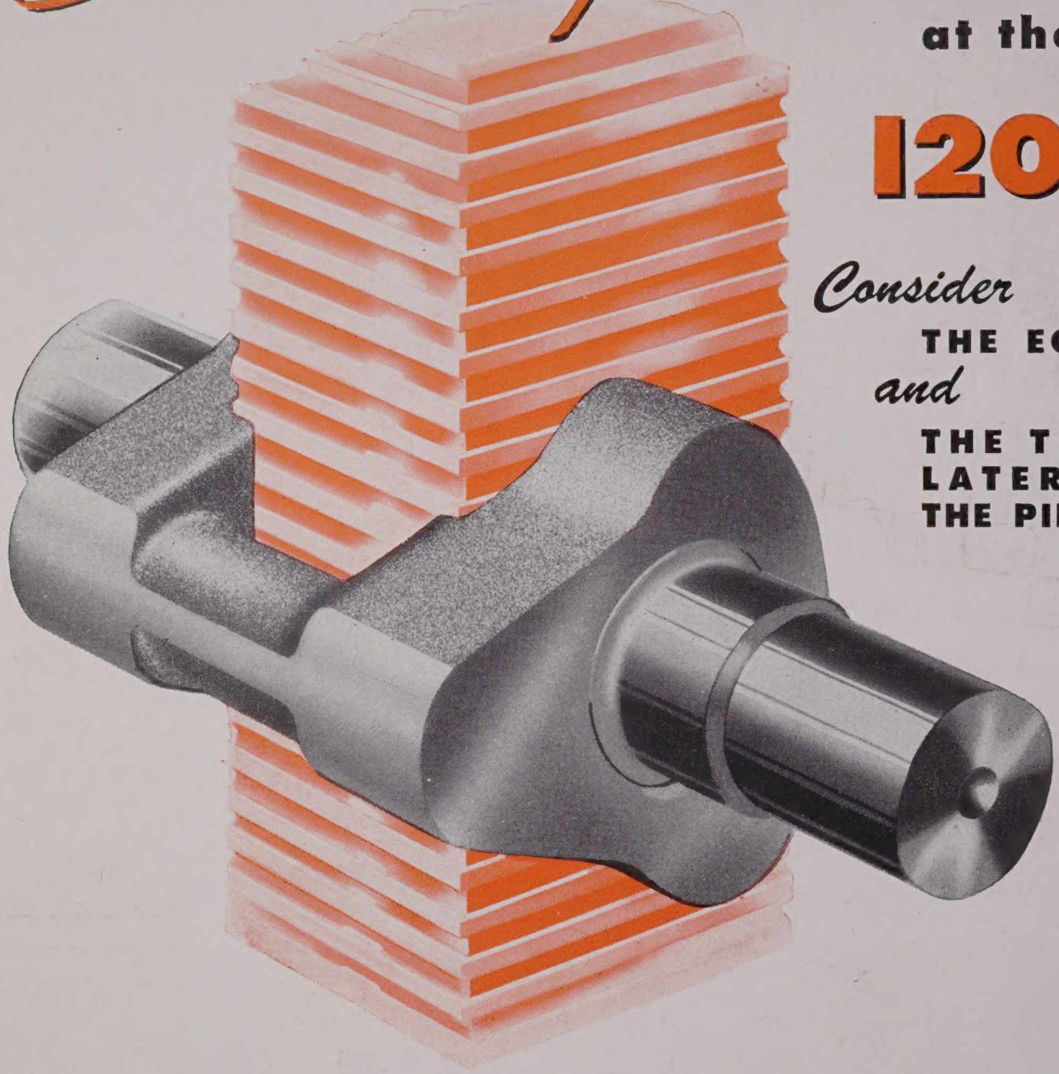

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